NP6016

SERVICE MANUAL

REVISION 0 JUNE 1994

Canon
FY8-13D2-000

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CANON NP6016 REV.0 JUNE 1994 PRINTED IN JAPAN

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I. FEATURES

The copier becomes ready to make copies as soon as it is turned on. When fitted with options, it provides a maximum of four paper sources.

1. ***Multiple front loading and multifeeder for space saving.***
   - The cassette may be slid out to the front for paper supply work.
   - With the adjustable cassette and the multifeeder, various types of paper may be used.
2. **Office amenities and ecology.**
   - The copier is equipped with a heating mechanism, which makes the copier ready for copying work at power-on without wait time.
   - The copier is designed compact, enabling effective use of office space.
   - The use of roller charging has proved to reduce the generation of ozone significantly. (1/100 to 1/1000 compared to other Canon copiers)
   - As the pick-up mechanism, center-reference is adopted in consideration of the use of recycled paper.
   - A significant number of parts are made of plastic in an effort to promote recycling.
   - The copier is designed as a clamshell type to facilitate clearing of jammed paper.
3. **Dependable high image quality.**
   - The new HQ (high-quality) toner ensures faithful reproduction of solid black, text, and photos.
   - In addition to Canon's own single-component toner projection development method, the use of auto image control (AIC) ensures stable reproduction of images.
4. **Practical basic features.**
   - As many as 16 copies (A4/Letter, horizontal) may be made per minute.
   - Copies may be as large as A3/Ledger or as small as A5/STMT, accommodating postcards.
   - The AE mechanism promises enhanced reproduction of newspapers or diazo originals.
   - Using page separation mode, a book may be copied with its left and right pages processed separately.
   - Copies may be made in zoom between 49% and 204%.
   - The zoom fine-adjustment mechanism ensures better control for faithful reproduction of originals.
   - The auto power-off mechanism helps further saving of energy.
   - The interrupt mechanism enables cutting in on a continuous copying session.

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II. SPECIFICATIONS

A. Copier

1. Type

Item	Description
Body	Desk top
Copyboard	Fixed
Light source	Fluorescent lamp
Lens	Zoom
Photosensitive medium	OPC

2. System

Item		Description
Copying		Indirect electrophotographic
Charging		Roller (direct charging)
Exposure		Slit (moving light source)
Copy density adjustment		Automatic (AE) or manual
Development		Dry (toner projection)
Pick-up	Auto	1 cassette
	Manual	Multifeeder
Transfer		Roller
Separation		Curvature + static eliminator
Cleaning		Cleaning blade
Fixing		Fixing (by plane-shaped heater; 1100 W max.)

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3. Features

Item			Specification
Original type			Sheet, book, 3-D object (2 kg/2.204 lb. max.)
Maximum original size			A3 (297 × 420 mm)/LDG (11" × 17") Center reference
Reproduction ratio			Direct, 4R4E, 4R3E, or 2R2E (Table 1-1) Zoom 49% to 204%
Wait time			0 sec
First copy			7.4 sec or less (9.8 sec or less at power-on; A4, Direct, non-AE, from cassette)
Continuous copying			100 (max.; upper limit may be varied in service mode)
Copying speed			See Table 1-2.
Copy size			Cassette: A3/11" × 17" to A5/STMT 3.94" × 5.88" Manual: A3/11" × 17" to postcard (vertical)
Copy paper	Cassette		Plain paper (64 to 80 g/m²), tracing paper (SM1), colored paper, recycled paper (64 to 80 g/m²), ecology paper (80 g/m²)
	Manual		Plain paper (64 to 80 g/m²), tracing paper (SM1, GNT80), colored paper, recycled paper (64 to 80 g/m²), ecology paper (80 g/m²), transparency, postcard, label sheet
	Two-sided/overlay	Manual	Plain paper (64 to 80 g/m²), colored paper, postcard, recycled paper (64 to 880 g/m²), ecology paper (80 g/m²)
Cassette			34 mm deep (approx.; about 250 sheets of 80 g/,m² paper), clawless, front loading (center reference)
Multifeeder			5 mm high (max.; about 50 sheets of 80 g/m²), clawless (center reference)
Copy tray			100 sheets (approx.; A3 size, 80 g/m²)
Non-image width		One-sided	2.0 ±1.0 mm (leading edge), 2.5 ±1.5 mm (left/right, trailing edge)
		Multi manual	2.0 ±1.0 mm (leading edge), 3.5 ±1.5 mm (left/right, trailing edge)
Auto clear			Available (2 min standard; may be varied between 1 to 9 min in 1-minute increments; may be disabled)
Auto power-off			Available (5 min standard; may be varied in user mode to 2, 5, 10, 15, 30, 60, 120 min)
Option			Cassette Feeding Module-B1, Cassette Feeding Module-A1, Control Card IV N, Stapler Sorter B2/D1, MS-B1 ADF-E1

Caution:
1. Use Canon-recommended paper.
2. Remove curling before feeding for a second time.
3. Fan out the transparencies before setting them on the multifeeder to prevent adhesion.

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4. Others

Item		Specifications	
Operating environment	Temperature	7.5°C to 32.5°C	
	Humidity	5% to 85%	
	Atmospheric pressure	810.6 hPa to 1013.3 hPa (0.8 to 1 atm)	
Power supply		Serial numbers	
	115 V	NCUxxxxx	
	230 V (50Hz/60Hz)	PAWxxxxx	
	230 V (50Hz)	UALxxxxx	
Power consumption	Maximum	1.5 kW or less	
	Standby	97.2 kJ per hr (27 wh average; reference only)	
	Continuous	2088 kJ (580 wh average; reference only)	
Noise	Copying	49.7 dB or less (1 m front)	Sound power level by ISO method
	Standby	—	
Ozone (average over 8 hr)		0.01 ppm or less (average); 0.02 ppm or less (max.)	
Dimensions	Width	585 mm	
	Depth	622 mm	
	Height	345 mm	
Weight		48 kg (approx.)	
Consumables	Copy paper	Keep wrapped to protect against humidity.	
	Cartridge	Avoid direct rays of the sun; keep at 40°C, 85%.	

Reproduction ratio	DIRECT	1: 1 (±0.5%)		
		100V/115V/230V	115V	230V
	REDUCE I	1: 0.500	1: 0.500	1: 0.500
	REDUCE II	1: 0.707	1: 0.647	1: 0.707
	REDUCE III	1: 0.816	1: 0.733	
	REDUCE IV	1: 0.865	1: 0.786	
	ENLARGE I	1: 1.154	1: 1.214	1: 1.414
	ENLARGE II	1: 1.224	1: 1.294	1: 2.000
	ENLARGE III	1: 1.414	1: 2.000	
	ENLARGE IV	1: 2.000		
	ZOOM	49% to 204 % (1% increments)		

Table 1-201 Standard Reproduction Ratios

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Reproduction ratio		Copy size	Q'ty	
			100V	230V
DIRECT	1: 1 (±0.5%)	A3 (297 × 420)	9	9
		A4 (210 × 297)	16	16
		A5 (148 × 210)	17	16
		B4 (257 × 364)	11	11
		B5 (182 × 257)	17	18
		A4R (297 × 210)	13	13
		A5R (210 × 148)	17	16
		B5R (257 × 182)	14	14
REDUCE	1: 0.500 (+1.0%)	A3 → A5R	13	13
	1: 0.707 (+1.0%)	A3 → A5R	11	11
		B4 → B5R	13	13
	1: 0.816 (+1.0%)	B4 → A4R	12	12
	1: 0.865 (+1.0%)	A3 → B4	10	10
		A4 → B5	17	17
ENLARGE	1: 2.000 (+1.0%)	A5R → A3	11	11
	1: 1.414 (+1.0%)	A4R → A3	10	10
		B5R → B4	11	11
	1: 1.224 (+1.0%)	A4R → B4	11	11
	1: 1.154 (+1.0%)	B4 → A3	10	10
		B5 → A4	17	17

Table 1-202ⓐ Copying Speed (100/230V)

Reproduction ratio		Copy size	Q'ty
DIRECT	1: 1 (±0.5%)	LTR	16
		11 × 17	9
		LGL	11
		LTRR	13
		STMT/STMTR	17
REDUCE	1: 0.786	LGL → LTRR	12
	1: 0.733	11 × 17 → LGL	11
		11 × 17 → LTRR	12
	1: 0.647	11 × 17 → LTRR	12
ENLARGE	1: 0.500	11 × 17 → STMTR	13
	1: 2.000	STMTR → 11 × 17	10
	1: 1.294	LTRR → 11 × 17	10
	1: 1.214	11 × 17 → STMTR	10

Table 1-202ⓑ Copying Speed (115V)

Specifications subject to change without notice.

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B. Cassette Feeding Module-B1/Cassette Feeding Module-A1

Copy paper	As per copier.
Cassette	As per copier.
Power supply	34 VDC, 24V, 5V (from copier)
Dimensions (mm)	Cassette Feeding Module-B1: 585W × 622D × 105H Cassette Feeding Module-A1: 585W × 622D × 210H
Weight	Cassette Feeding Module-B1: 5kg Cassette Feeding Module-A1: 10kg

Table 1-203

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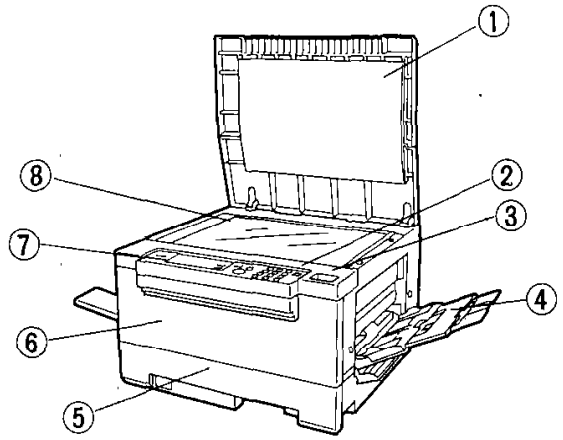
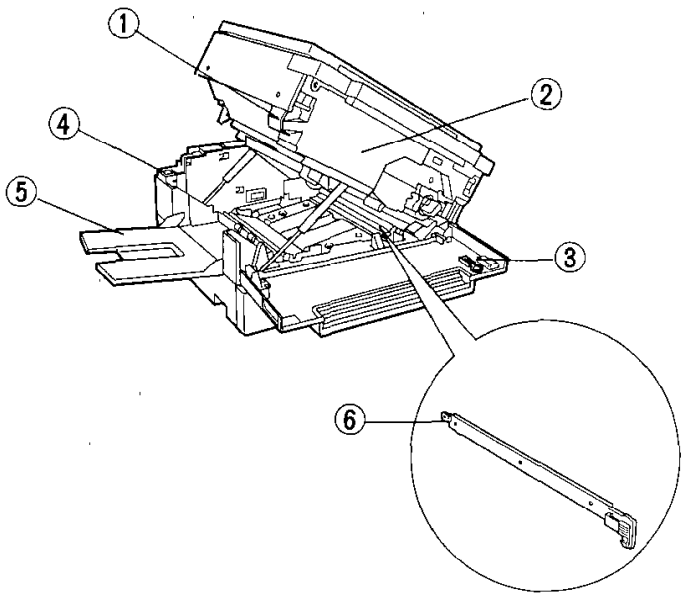
III. NAMES OF PARTS

A. Exterior View



① Copyboard cover
② Power switch
③ Clip tray
④ Multifeeder
⑤ Cassette
⑥ Front door
⑦ Control panel
⑧ Copyboard glass

Figure 1-301



① Open/close lever
② Copy density correction knob
③ Static eliminator cleaner
④ Heater switch
⑤ Copy tray
⑥ Static eliminator

Figure 1-302

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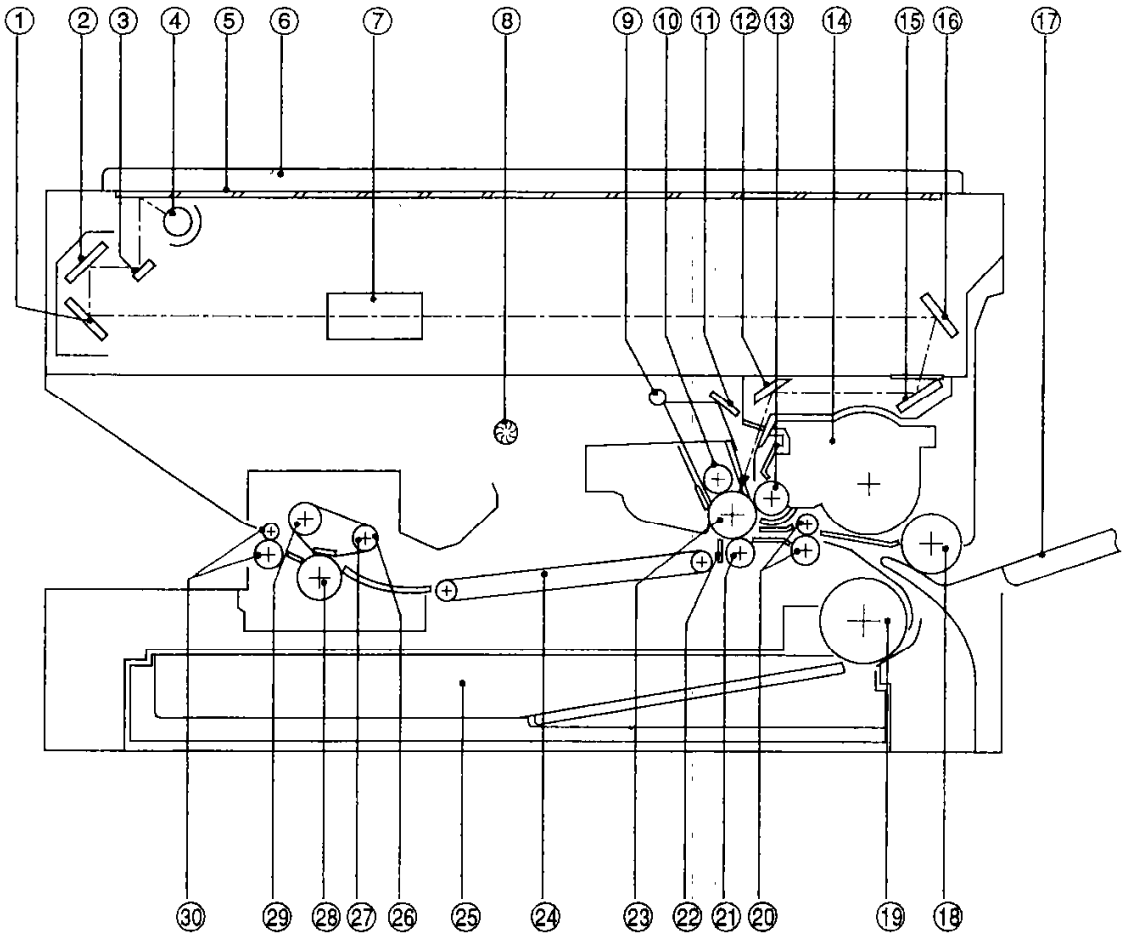
B. Cross Section

1. Body



① No. 3 mirror
② No. 2 mirror
③ No. 1 mirror
④ Scanning lamp
⑤ Copyboard glass
⑥ Copyboard cover
⑦ Lens
⑧ Exhaust fan
⑨ Pre-exposure lamp
⑩ Primary charging roller
⑪ Reflecting plate
⑫ No. 6 mirror
⑬ Developing cylinder
⑭ Developing assembly
⑮ No. 5 mirror
⑯ No. 4 mirror
⑰ Multifeeder tray
⑱ Multifeeder pick-up roller
⑲ Cassette pick-up roller
⑳ Registration roller
㉑ Transfer roller
㉒ Separation static eliminator
㉓ Photosensitive drum
㉔ Feeding assembly
㉕ Cassette
㉖ Fixing film
㉗ Film tension roller
㉘ Film pressure roller
㉙ Film drive roller
㉚ Delivery roller

Figure 1-303

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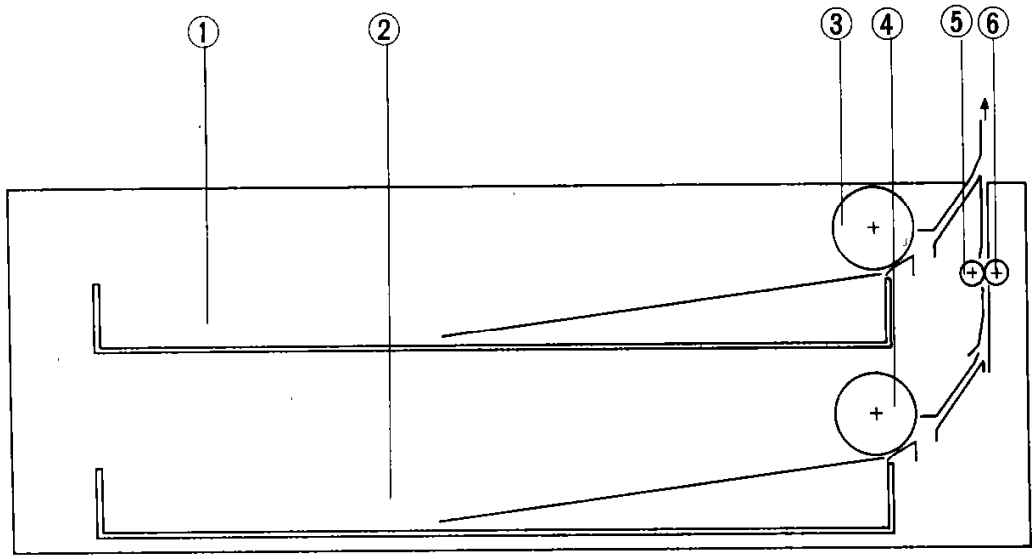
2. Cassette Feeding Module-A1



① Cassette 2
② Cassette 3
③ Cassette 2 pick-up roller
④ Cassette 3 pick-up roller
⑤ Drive roller
⑥ Feeding roller

Figure 1-304

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IV. OPERATION

A. Control Panel

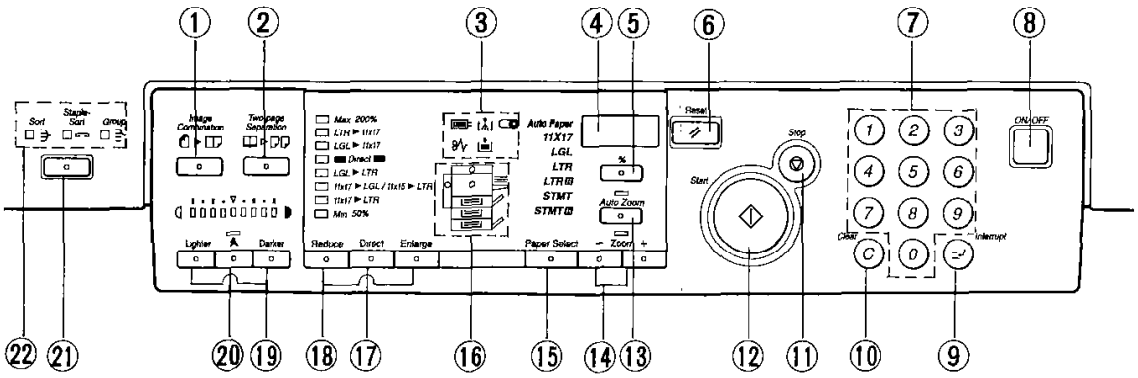

Figure 1-401

Ref.	Key	Description	Remarks
①	Image Compose key	Press to set/reset image composition mode.	Only when an ADF (option) is installed.
②	Page Separate key	Press to set/reset page separation mode.	
③	Warning indicator	Flashes when the control card is not properly inserted, when the toner cartridge must be replaced, when a jam has occurred, or when paper has run out. Further, flashes/remains on to indicate need for drum cartridge replacement. (North America only)	
④	Display	Indicates the copy count/reproduction ratio, mode settings (3 digits).	
⑤	% key	Press to display the specified reproduction ratio.	
⑥	Reset key	Press to return to standard copy mode.	Standard mode: reproduction ratio ..... 100% copy count ..... 1 paper source ..... cassette density adjustment ..... AE As high as '100' may be set.
⑦	Keypad	Use it to specify a copy count or enter mode settings.	
⑧	Power switch	Use it to turn on and off the power.	
⑨	Interrupt key	Press to interrupt an ongoing copying session.	
⑩	Clear key	Press to clear a copy count or mode settings.	
⑪	Stop key	Press to stop copying operation.	
⑫	Start key	Press to start copying operation.	
⑬	Auto Ratio key	Press it to set/reset auto ratio mode.	Only when an ADF (option) is installed.
⑭	Zoom key	Press to set a reproduction ratio.	May be set between 49% and 204% in 1% increments.
⑮	Paper Select key	Press to select a cassette or multifeeder.	
⑯	Cassette/Jam indicator	Turns on to indicate the selected cassette/multifeeder; flashes when a jam occurs; remains on when the sorter and right door must be checked or, when the original jams.	
⑰	Direct key	Press to return to Direct (100%).	
⑱	Reduce/Enlarge key	Press to select Reduce/Enlarge (standard reproduction ratio).	
⑲	Copy density key	Use it to adjust the density of copies manually.	
⑳	AE key	Press to set/re-set AE mode or user mode.	
㉑	Sorter key	Press it to select/reset sort, staple/sort, or group mode.	Only when an sorter (option) is installed.
㉒	Sorter indicator	Turns on to indicate selected delivery mode.	

Table 1-401

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B. Making Copies

1) Turn on the power.
   - The wait time is about 0 sec.
2) Lift the copyboard cover, and place the original face down aligned with the size index.
   - Place the original so that its center is aligned to → shown in Figure 1-402; then, close the copyboard cover.

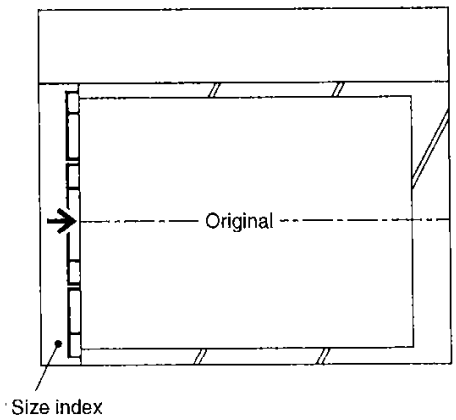

Figure 1-402

3) Select a reproduction ratio.
   ① Reduce, Direct, and Enlarge Keys
   Use it to make a standard-sized copy of a standard-sized original.
   ② Zoom Key
   Use it to set a reproduction ratio between 49% and 204% in 1% increments.
4) To specify a paper size, press the Paper key.
   ① If appropriate paper is not in the cassette, place paper in the multifeeder.
5) Specify the copy density.
   ① To make copies in AE mode, press the AE key, and check that the AE indicator has turned on.
   ② To obtain darker copies manually, press the Darker key to move the index to the right; to obtain lighter copies, on the other hand, press the Lighter key to move the index to the left.

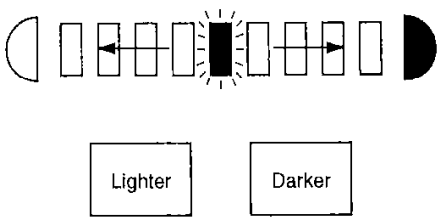

Figure 1-403

Note:
Adjust the density manually if the original is a transparency or others that have a high transparency.

6) Specify the number of copies to make (1 through 100) using the keypad, and check the copy count indicator.
   ① If the keypad does not accept input or if you made a mistake, press the Clear key Ⓒ to try once again.
7) Press the Copy Start key ◇ .
   - If the intensity of the lamp is below the specified value, wait until it reaches the specified value.
   ① As many copies as specified will be made.
   - If an ADF is installed, the originals set on the original tray are auto matically picked up for copying.
   ② You cannot change the current copy mode between when the copying operation has started and when the last copy has been made by pressing keys other than the Stop, Reset, and Copy Density keys.
   ③ You may switch from automatic density adjustment to manual density adjustment between when copying operation has started and when the last copy has been made; however, you cannot switch from manual density adjustment to automatic density adjustment.

Reference:
If copies made in AE mode are too dark or too light, press the Copy Density key while copies are being made, using copies made in AE as a reference.

   ④ To stop continuous copying operation, press the Stop key or Reset key; the operation stops after finishing the ongoing copying sequence.
   ⑤ When all copies have been made, the copy count indicates the initial count. When you press the Copy Start key after replenishing the cassette with copy paper after copying operation has stopped in response to the absence of paper, the remaining number of copies will be made automatically.

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⑥ The Jam message appears and the copying operation stops if a jam occurs. The copy count will indicate the remaining number of copies when you clear the jam.

⑦ The copier will return to standard mode if you left it alone for about 2 min after a copying session or after any key operation. The copier will turn off automatically if you leave it alone for about 5 min* (auto power-off).
*30 min for North America.
(You may change the auto clear time or auto power-off time; see the descriptions on user mode on p. 1-14.)

Caution:
1. **Feed postcards vertically.**
2. **Feed A4/Letter label sheets horizontally.**

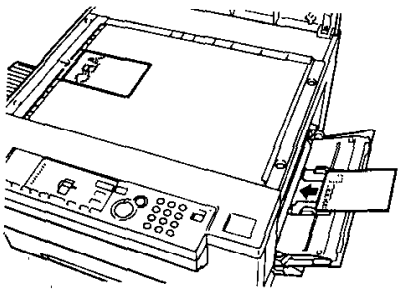

Figure 1-404 (Feeding a Postcard)

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C. Making Two-Sided/Overlay Copies (manual)

You can make two-sided or overlay copies by manually feeding paper. You must, however, keep the following in mind when making such copies:

① Be sure to orient the paper the same way for both sides when turning it over.
② Make sure that the paper has not absorbed moisture.
③ Make sure that the paper has no curling.
④ After copying on the first side, sufficiently cool the paper; then, correct any curling before feeding it for a second time.
⑤ Use paper of 60 to 128 g/m².
⑥ Correct any curling on postcards or thick paper (128 g/m²) before copying on the second side.

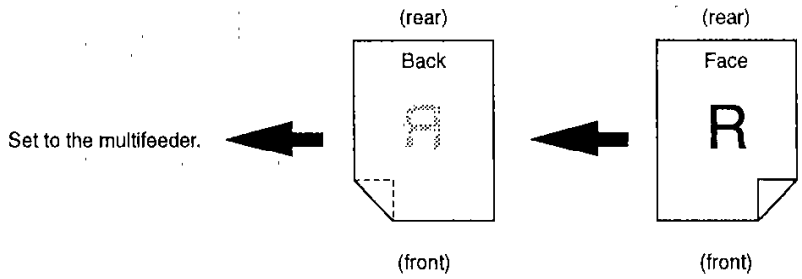

Figure 1-405

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D. User Mode

1. Outline

The copier provides user mode, which allows the user to change various settings or to make various adjustments on his/her own; see Table 1-402.

Menu No.	Display	Function	Description	Default settings
1	U 1	Changing the auto clear time	You may set the auto clear time between 1 and 9 min in 1-min increments. Setting it to '0' disables the function.	2 min
2	U 2	Changing the auto power-off time	You can set the auto power-off time to either 2, 5, 10, 15, 30, 60, or 120 min.	5 min (30 min for North America)
3	U 3	Fine adjusting (zoom)	You can correct a slight discrepancy between original and copy sizes (direct); enlarge in X direction and reduce in Y direction independent of each other.	± 0%
5	U 5	Turning on/off auto sort/non-sort (with ADF* and sorter* installed) *Option	You may specify whether to evecute auto sort/non-sort.	On
6	U 6	Cleaning the feeder (with ADF* installed) Option	Use it to clean the pick-up assembly of the ADF.	
7	U 7	Clearing the 'Replace Drum Counter/Drum' message (North America only)	Use it to clear the total copy count indication or to stop the message (flashing).	
9	U 9	Selecting a density adjustment method for standard mode	You can specify either AE or manual for density adjustment for standard mode.	AE
0	U 0	Initializing user mode	You can return settings changed in user mode to initial settings.	

Table 1-402

2. Common Operations

a. Keys to Use in User Mode

- Clear Key
  Use it to return to the previous step; or, use it to clear a setting entered by mistake when making mode settings.
- Start Key
  Use it to accept a selected item when making user mode settings.
- AE Key
  Use it to return to copy mode when making user mode settings.

b. Operation

1) Hold down the AE key for about 4 sec or more.
   - This will turn on the display, indicating "U 1".
2) Enter the menu number of each function using the keypad.
3) Press the Start key.
   - The current setting of the respective function appears.
4) Enter a new setting using the appropriate key.
5) Press the start key.
   - The copy count/ratio indictor turns on to indicate the user mode being changed.

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- The setting of the respective user mode is changed.

6) Press the AE key.
   - The copier returns to standby state.

3. Changing the Auto Clear Time (U 1)

1) Hold down the AE key for 4 sec or more.
   - "U 1" appears on the display.
2) Press the Start key.
   - The display indicates the current setting (if initial, indicates '1-2').
3) Enter a desired setting using the keypad.
   - The display indicates the new setting (if 5 min, indicates '1-5').
4) Press the Start key. "U 1"
5) Press the AE key.
   - The copier returns to standby state.

4. Changing the Auto Power-Off Time (U 2)

1) Hold down the AE key for 4 sec or more.
   - "U 1" appears on the display.
2) Enter '2' using the keypad so that the display indicates "U 2".
3) Press the Start key.
   - The display indicates the current setting (if initial, indicates '2-2').
4) Enter a desired setting using the keypad.

Auto power-off time (min)	Settings
2	2-1
5	2-2
10	2-3
15	2-4
30	2-5
60	2-6
120	2-7

Table 1-403

   - The display indicates the new setting (if 10 min, indicates '2-3').
5) Press the Start key.
   - The auto power-off time is changed, and the display returns to "U 2".
6) Press the AE key.
   - The copier returns to standby state.

Reference:
If you want to disable the auto power-off function, use service mode (See p. 3-82.).

5. Zoom Fine-Adjustment (U 3)

1) Hold down the AE key for 4 sec or more.
   - The display indicates "U 1".
2) Enter '3' using the keypad so that the display indicates "U 3".
3) Press the Start key.
   - The display indicates '3-1' suggesting the direction of adjustment.

Direction of adjustment	Display
X direction (horizontal)	3-1
Y direction (vertical)	3-2

Table 1-404

   Further, the copy density indicator shows the current setting. (See Figure 1-406.)
4) Press the copy density key to adjust the reproduction ratio in X direction. (See Figure 1-406.)
5) Press the Start key.
   - The reproduction ratio in X direction is fine-adjusted, and the display indicates '3-2'. Further, the copy density indicator shows the current setting. (See Figure 1-406.)
6) Press the Density key to adjust the reproduction ratio in Y direction. (See Figure 1-406.)
7) Press the Start key.
   - The zoom reproduction is fine-adjusted, and the display returns to "U 3".
8) Press the AE key.
   - The copier returns to standby state.

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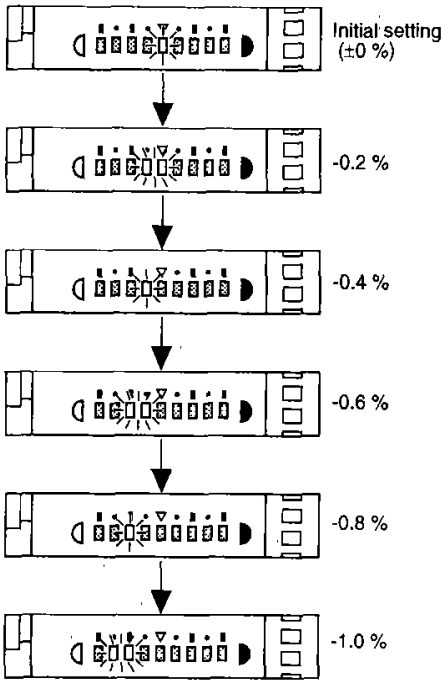
The fine-adjustment reproduction ratios as shown in the copy density display are as follows:

■ Zoom Fine-Adjustment (Reduce)
Press the Lighter key.



■ Zoom Fine-Adjustment (Enlarge)
Press the Darker key.

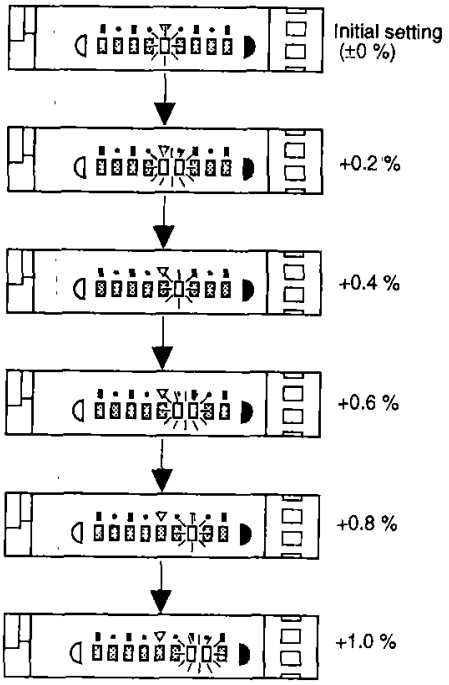


Figure 1-406

6. Turning On and Off the Auto Cassette Change Mechanism (U 4)

1) Hold down the AE key for 4 sec or more.
   • The display indicates " U 1 ".
2) Enter ④ using the keypad so that the display indicates " U 4 ".
3) Press the Start key.
   • The display indicates the current setting (if initial setting, '4-1').

State of auto cassette change function	Settings
On	4-1
Off	4-0

Table 1-405

4) Enter ① or ⓪ using the keypad to specify 'On' or 'Off'.
   • The display indicates the new setting (if Off, '4-0'.)
5) Press the Start key.
   • The auto cassette change function is turned on or off, and the display returns to " U 4 ".
6) Press the AE key.
   • The copier returns to standby state.

7. Turning On/Off the Auto Sort/Non-Sort (with ADF and sorter installed—option) (U 5)

1) Hold down the AE key for 4 sec or more.
   • The display indicates " U 1 ".
2) Enter ⑤ using the keypad so that the display indicates " U 5 ".
3) Press the Start key.
   The display indicates the current setting (if initial settings, '5-1').

Turning on/off the auto cassette change mechanism	Settings
On	5-1
Off	5-0

Table 1-406

4) Enter ① or ⓪ using the keypad to select On or Off.
   • The display indicates the new setting (if Off, '5-0').
5) Press the Start key.
   • The auto cassette change will be either On or Off, and the display returns to " U 5 ".
6) Press the AE key.
   • The copier returns to standby state.

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8. Cleaning the Feeder (with ADF installed—option) (U 5)

1) Hold down the AE key for 4 sec or more.
   • The display indicates "U 1".
2) Enter ⑥ using the keypad so that the display indicates "U 5".
3) Place about 10 sheets of blank copy paper (white) on the ADF's original tray.
4) Press the Start key.
   • Feeder cleaning starts; to stop, press the Stop key.
   During the cleaning operation, "U 5" on the display flashes; then, "U 5" stops flashing and remains on.
5) Press the AE key.
   • The copier returns to standby state.

9. Clearing the 'Drum Counter/Replace' Message (flashing; North America only) (U 7)

1) Hold down the AE key for 4 sec or more.
   • The display indicates "".
2) Enter ⑦ using the keypad so that the display indicates "U 7".
3) Press the Start key.

Clearing Drum Counter/Replace Drum Message (flashing)	Settings
Drum counter	7-1
Flashing indicator	7-2

Table 1-407

4) Enter ① or ② using the keypad to select 'drum counter' or the message (flashing). If you select the message, '7–2' appears on the display.
5) Press the Start key.
   • If '7–1' is displayed, the total copy count will be indicated on the display in units of 100s.
   • If '7–2' is displayed, the 'Replace Drum' message (flashing) on the control panel will be cleared and "U 7" returns to the display.
6) Press the AE key.
   • The copier returns to standby state.

10. Selecting the Density Adjustment Method for Standard Mode (U 9)

1) Hold down the AE key for 4 sec or more.
   • The display indicates "U 1".
2) Enter ⑨ using the keypad so that the display indicates "U 9".
3) Press the Start key.
   • The display indicates '9-1'.

Selecting the density adjustment method for standard mode	Settings
AE (automatic)	9-1
Manual	9-0

Table 1-408

4) Enter ① or ⓪ using the keypad to select AE or manual so that the display indicates the new specification (if manual, indicates '9-0').
5) Press the Start key.
   • The new specification is stored, and the display returns to "U 9".
6) Press the AE key.
   • The copier returns to standby state.

11. Initializing User Mode (U 0)

1) Hold down the AE key for 4 sec or more.
   • The display indicates "U 1".
2) Enter ⓪ using the keypad so that the display indicates "U 0".
3) Press the Start key.
   • The display indicates '0-1'.
4) Enter ⓪ using the keypad.
   • The display indicates "0 0".
5) Press the Start key.
   • User mode is initialized, and the display returns to "U 0".
6) Press the AE key.
   • The copier returns to standby state.

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12. Quick Guide to User Mode

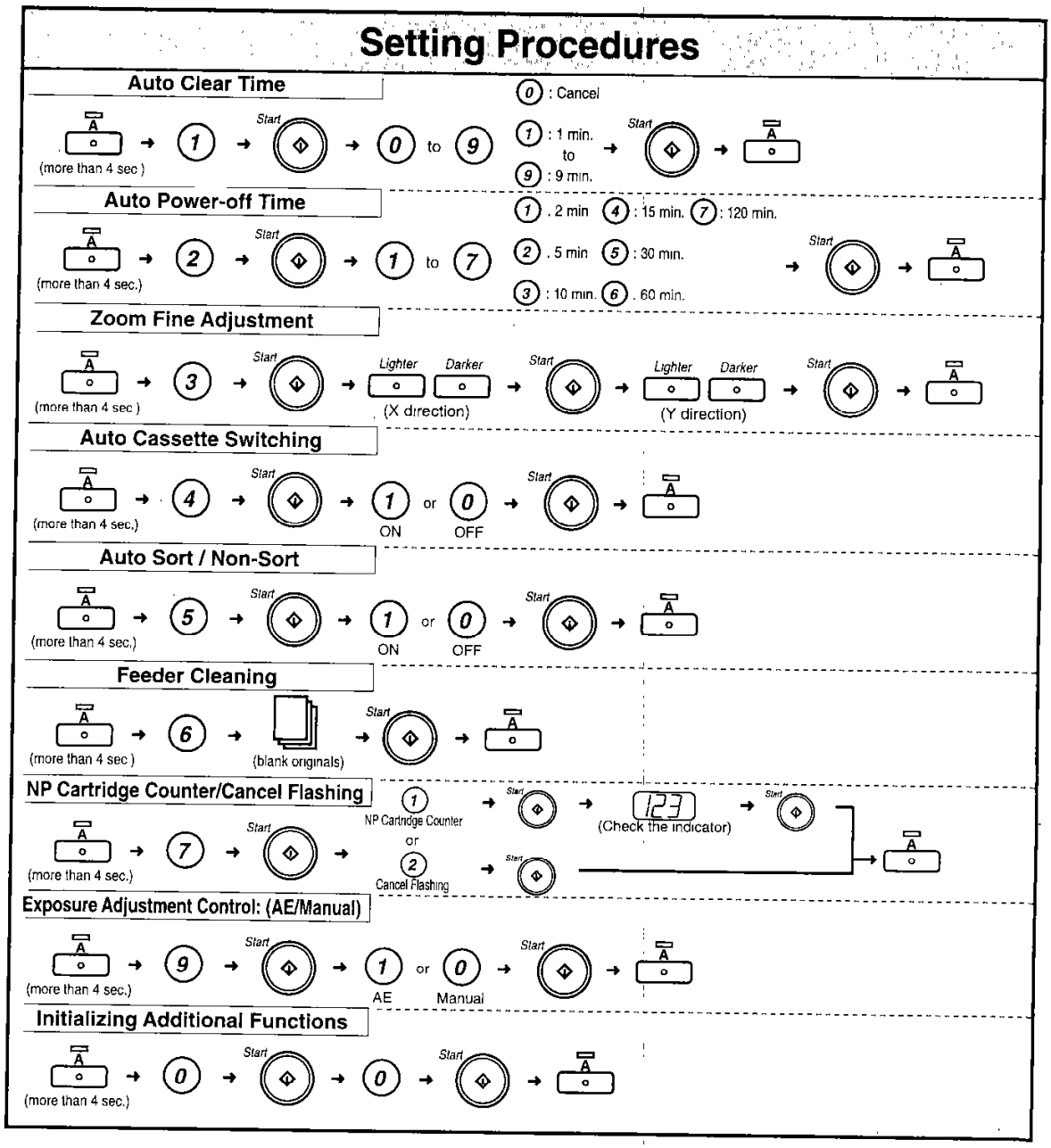

Table 1-409

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V. WARNINGS AND ACTIONS

A. Jam Indicator

The respective indicator flashes when there is a jam in the corresponding location. Make a check and take the appropriate action as described below.

For instructions as to removing jams from any option (sorter/ADF), see its respective service manual.

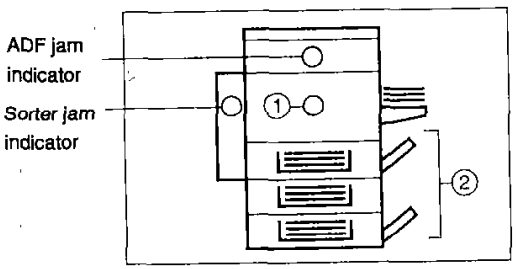

Figure 1-501

If the copier jams, check first the pick-up assembly, separation/feeding assembly, fixing/delivery assembly, and drum cartridge, and remove the jam if found.

1. Flashing ①

1) Open the copier front door.
2) Open the copier's top body by operating the copier open/close lever.

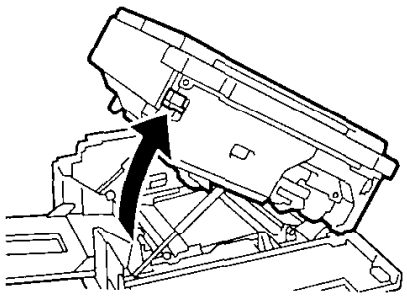

Figure 1-502

3) If paper is found in the registration assembly, turn the knob clockwise, and pull out the paper in the direction of the arrow, taking care not to tear it. At the time, be careful not to touch the transfer roller.

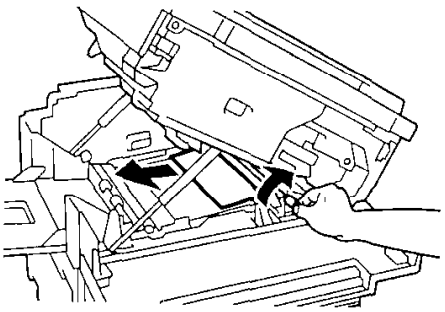

Figure 1-503

4) If paper is found in the feeding assembly, pull out the paper toward the front. At the time, take care not to touch the drum.

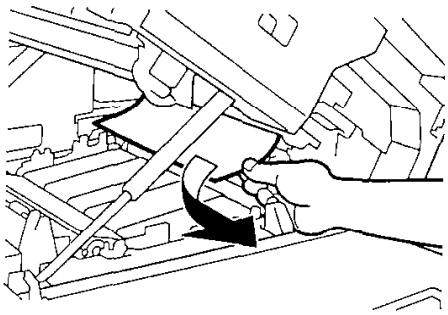

Figure 1-504

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5) If paper is found in the pick-up assembly,
   - Remove the paper from the multifeeder, and remove the jam.

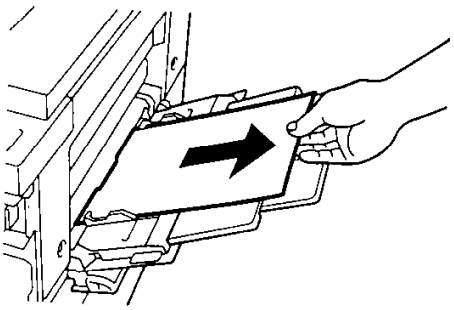

Figure 1-505

- Close the multifeeder, and open the right side door of the copier cassette assembly; then, remove the paper as shown.
- If the paper is stuck deep inside, open the inside guide to remove it.

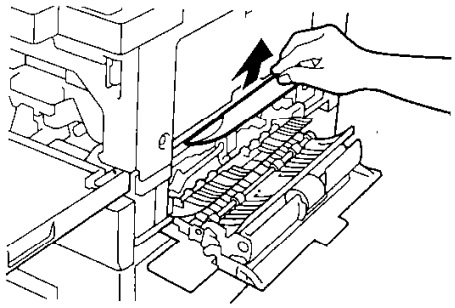

Figure 1-506

6) If paper is found in the fixing/delivery assembly,
   - Open the copier front door.
   - Open the copier top body cover by operating the copier open/closed lever.
   - Pull out the paper in the direction of feeding. At the time, take care not to touch the fixing roller, which is likely to be very hot.

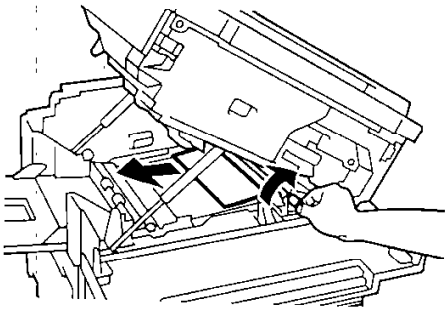

Figure 1-507

7) When you have removed all paper, close the copier top body and the front door.

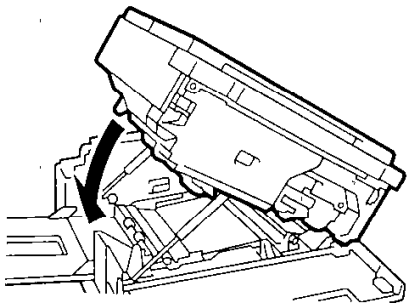

Figure 1-508

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2. ② Flashing

1) Open the copier front door.
2) Open the door to the cassette assembly shown by the flashing indicator. If the copier cassette assembly (top) is indicated, additionally open the inside guide.

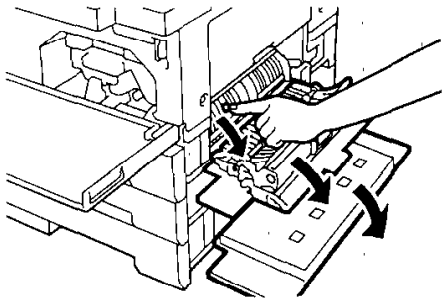

Figure 1-509

3) Pull out the paper in the direction of the arrow.

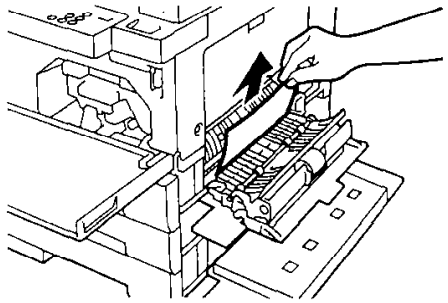

Figure 1-510

4) If you cannot remove the paper as described in step 2) or 3), slide out the cassette from the cassette assembly shown by the flashing indicator.

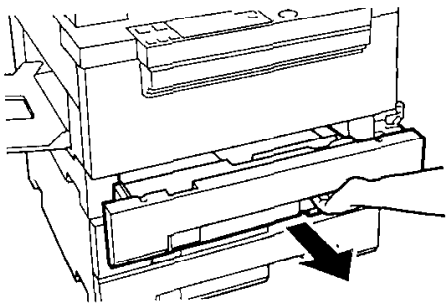

Figure 1-511

5) Remove the paper that is sticking out of the cassette.

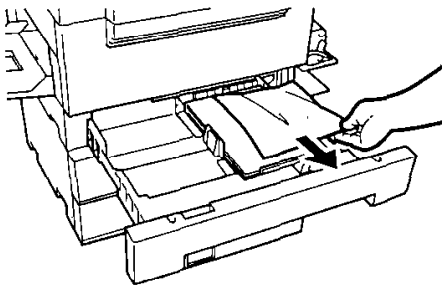

Figure 1-512

6) Slide in the cassette. If it is the copier cassette assembly, firmly close the right side door of the inside guide and copier cassette assembly.

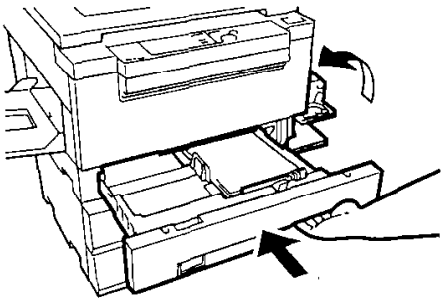

Figure 1-513

7) When you have removed all paper, close the front door.

Caution:
If you closed the front door before closing others, you must open and close the front door once again.

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B. Paper Indicator

The indicator flashes if no cassette is set in the cassette holder or the cassette is out of paper.

1. Replenishing the Cassette with Paper

1) Slide out the cassette until it stops.

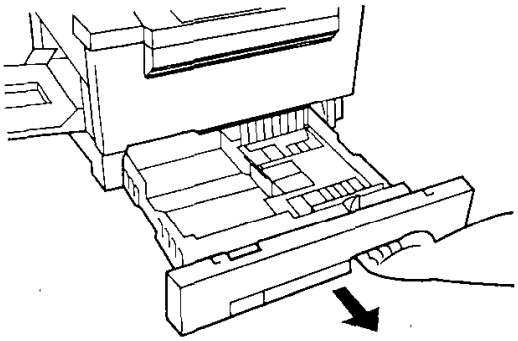

Figure 1-514

2) Open the package, and take out the paper.

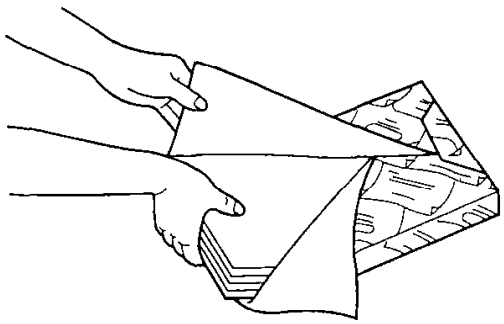

Figure 1-515

3) Hold the stack of paper, and put it in the cassette butting it against the right side of the cassette.
Make sure that the side of the stack that appeared when you separated the wrapping is facing the bottom of the cassette.

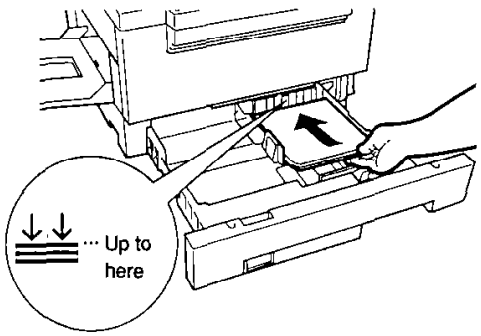

Figure 1-516

4) Set the cassette in the copier.

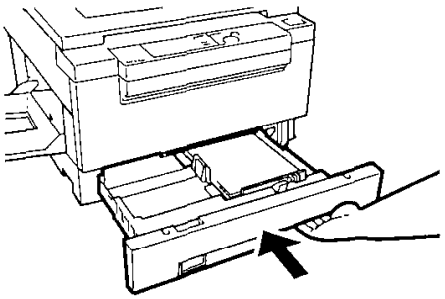

Figure 1-517

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C. Replacing the Static Eliminator

1) Open the front door, and open the copier's top body by operating the copier open/close lever.

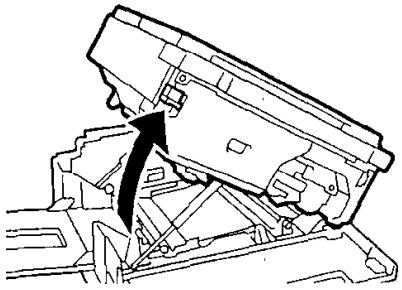

Figure 1-518

2) Lift the static eliminator to detach it from the copier by holding the pick found at the front.

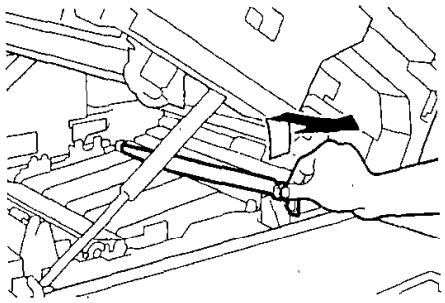

Figure 1-519

3) Insert a new static eliminator with its rear end first, and push it until a click is felt.

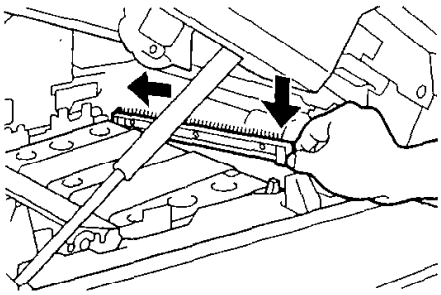

Figure 1-520

Caution:
You must replace the static eliminator before replacing the drum cartridge.

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D. Replace Toner Indicator

The indicator flashes when the developing assembly runs out of toner.

1) Open the copier front door.
2) While pushing the grip on the toner cartridge, turn it clockwise until it stops; then, pull out the toner cartridge toward the front.

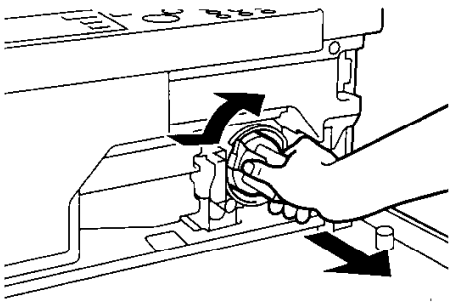

Figure 1-521

3) Hold the new toner cartridge level, and shake it back and forth several times to even out the toner inside.

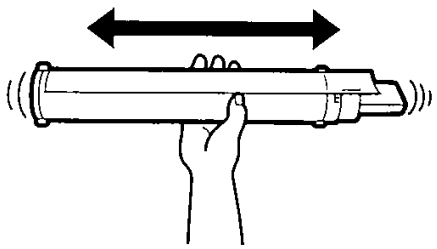

Figure 1-522

4) Insert the toner cartridge into the copier until it stops.

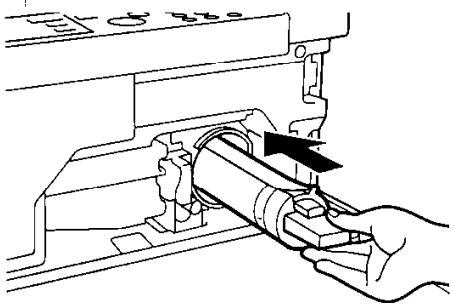

Figure 1-523

5) Hold the orange portion of the OPEN seal, and remove the seal by pulling it straight out while holding the toner cartridge in place.

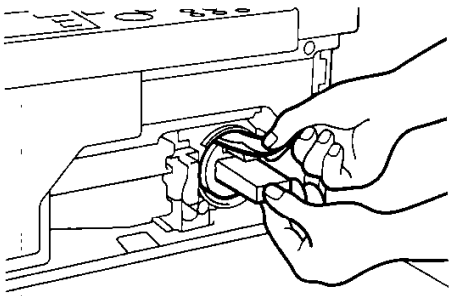

Figure 1-524

6) Turn the grip of the toner cartridge counterclockwise until it locks.

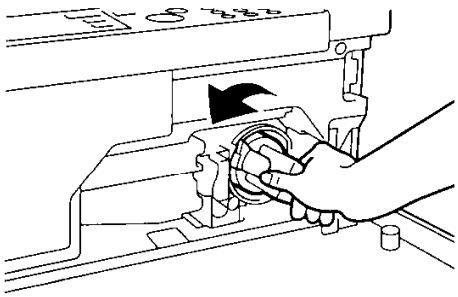

Figure 1-525

7) Close the front door.

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E. Control Card Indicator

The control card indicator flashes under the following conditions when the copier is configured for a control car unit (option).

- No control card is inserted or inserted but improperly.
- A control card is inserted in the control card unit, but the card is not valid for the unit.

Reference:
The indicator flashes if a control card remains inserted at power-on.

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VI. ROUTINE MAINTENANCE BY THE USER

Make sure that the user cleans the following parts once a week:

① Copyboard Glass
Use a cloth moistened with water or mild detergent solution; then, dry wipe it.

② Copyboard Cover
Use a cloth moistened with water or mild detergent solution; then, dry wipe it.

③ Static Eliminator
If separation jams occur frequently, use the special brush (accessory) to clean it; the eliminator need not be cleaned as often as once a week.

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I. IMAGE FORMATION

A. Outline

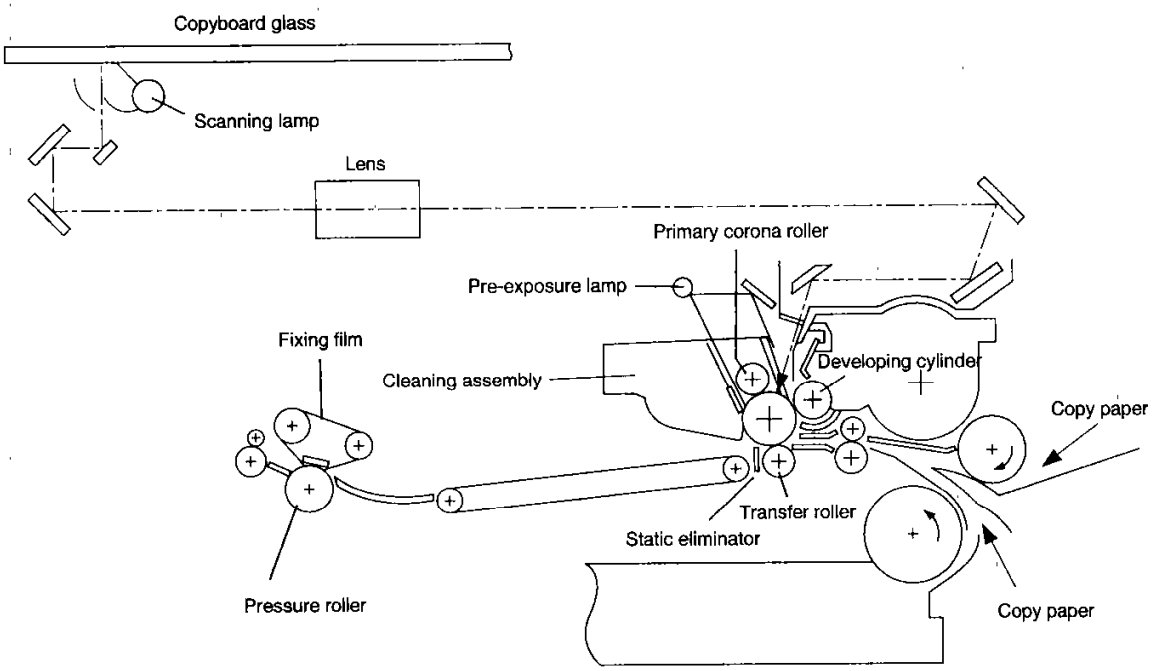

Figure 2-101

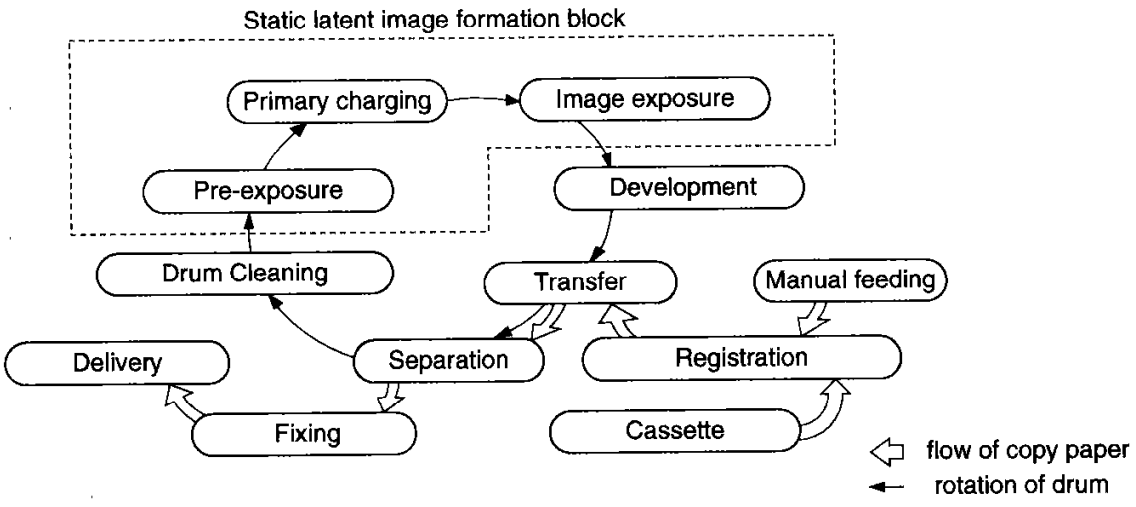

Figure 2-102

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The copier forms images through the following steps, and each of the step functions as described below.

step 1 pre-exposure
step 2 primary charging (negative DC)
step 3 image exposure
step 4 development (AC and negative DC bias)
step 5 transfer (negative DC)
step 6 Separation (curvature + static eliminator)
step 7 fixing
step 8 drum cleaning

The photosensitive drum consists of a photoconducting layer on the outside and an aluminum base on the inside; the photoconducting layer is made of organic photoconductor (OPC), and the aluminum conductor is a photoconductor.

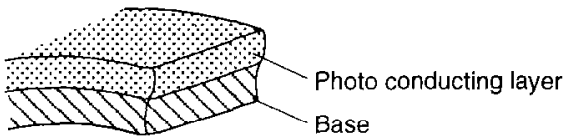

Figure 2-103

B. Latent Static Image Formation Block

The block consists of three steps; at the end of the block, areas of the drum corresponding to the black areas of the original are left with negative charges and the areas of the drum corresponding to the white areas of the original are rid of negative charges.

The images formed on the drum by the presence and absence of negative charges are not visible to the human eye and, therefore, the term *latent static* images.

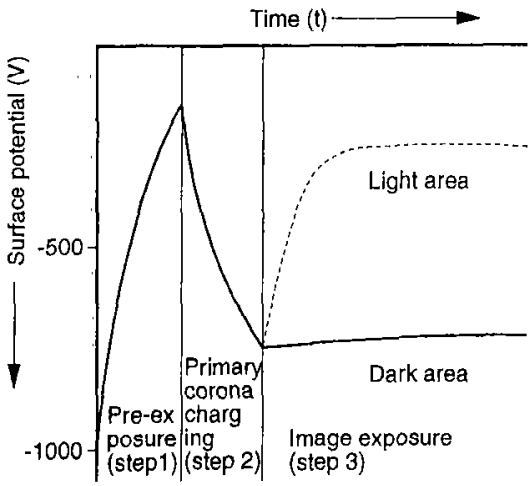

Figure 2-104

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C. Step 1 (pre-exposure)

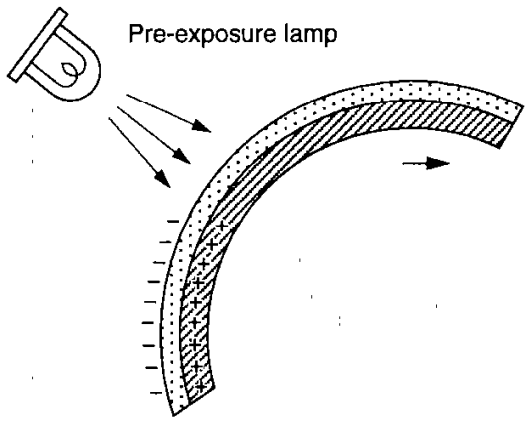

Figure 2-105

Before primary charging takes place, the light of the pre-exposure lamp is directed to the photosensitive drum to eliminate the residual charges on the drum, thereby preventing uneven density.

D. Step 2 (primary charging)

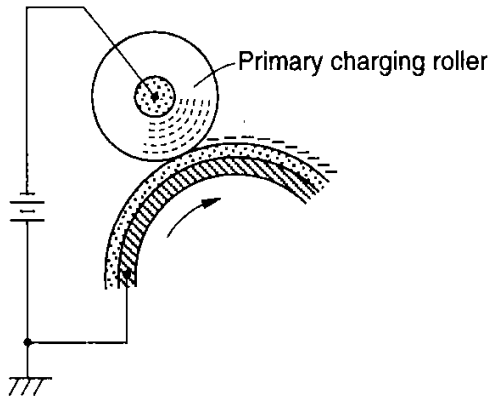

Figure 2-106

The copier uses what is termed *primary charging*, in which a charging roller made of conducting roller directly charges the photosensitive drum. Compared to the conventional corona charging method, direct charging provides such advantages as a low application voltage and virtual absence of ozone.

The primary charging roller is a special roller and possesses different characteristics from the transfer roller.

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E. Step 3 (image exposure)

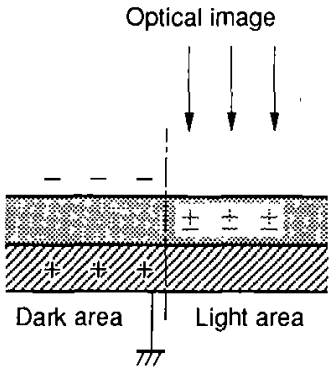

Figure 2-107

In this step, the optical image of an original is projected on the photosensitive drum to neutralize the charges in the *light* areas.

F. Step 4 (development)

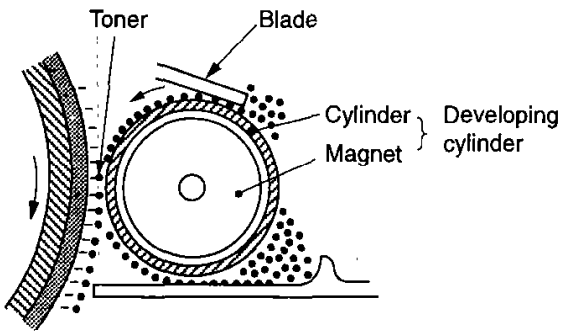

Figure 2-108

As shown in Figure 2-108, the developing assembly consists of a fixed magnet, a cylinder that rotates around the magnet, and a rubber blade.

The toner is a one-component toner whose main ingredient is magnetic resins.

The toner has insulating characteristics and becomes positively charged by friction against the rubber blade, which remains in contact under pressure with the cylinder; the toner is evened out to form a thin layer on the cylinder owing to the elasticity of the rubber.

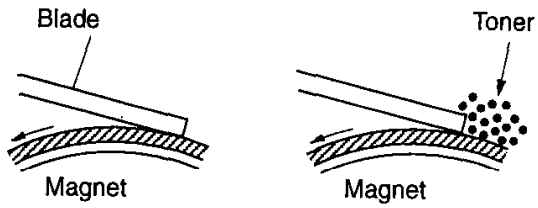

Figure 2-109

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An AC bias and DC bias (negative component) are applied simultaneously* to the developing cylinder and the blade.

* Termed *development bias*, whose negative component is larger than that of the positive component.

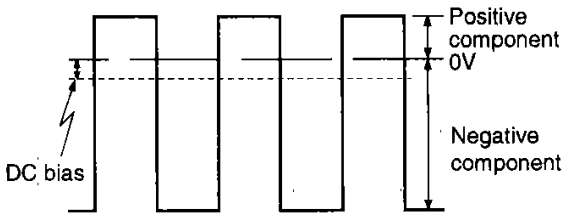

Figure 2-110

During copying operation, the drum surface potential and development bias (at time of positive component) draws toner to the photosensitive drum to turn the latent static image into a visible image. The excess toner is drawn away from the photosensitive drum by the work of the drum surface potential and the developing bias (at time of negative component).

The AC bias (frequency, in particular) mainly affects gradation; a lower frequency improves the gradation, but tends to result in fogging. The DC bias affects copy density and fogging; a higher bias, that is closer to 0 V, darkens the image but in turn could lead to fogging.

G. Step 5 (transfer)

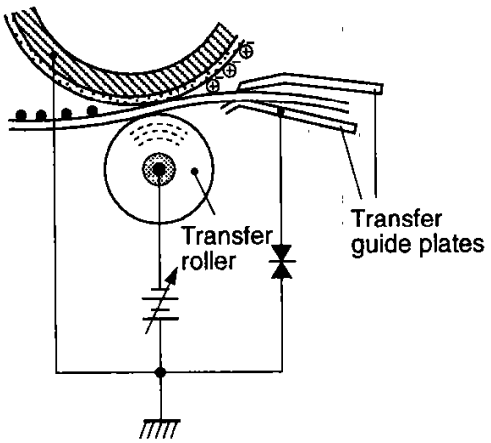

Figure 2-111

The transfer roller deposits negative charges on the back of copy paper to attract toner from the drum surface to the copy paper.

The copier uses a roller transfer method, which requires a lower transfer voltage compared to corona transfer methods and generates virtually no ozone.

To prevent transfer failure or soiling of the back of copy paper, the transfer guide is grounded through a varistor.

Reference:
If the transfer guide was grounded, the charges that should be on the back of copy paper would escape, causing transfer failure; by the same token, if the transfer guide is not grounded at all, it would become charged and soiled with deposits of toner, soiling the back of copy paper.

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Reference:
If the image on the photosensitive drum fails to transfer to copy paper because of a jam or the like, the transfer charging roller could become soiled with toner.
To prevent such a problem, the copier uses a positive transfer voltage when the scanner is moving in reverse or during post rotation, thereby returning the positively charged toner on the transfer roller to the photosensitive drum.

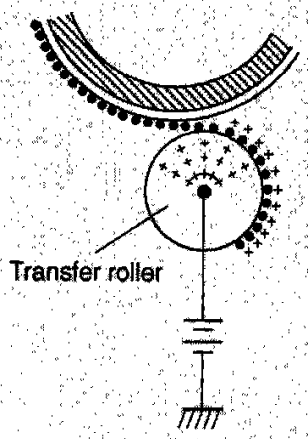

Figure 2-112

H. Step 6 (separation)

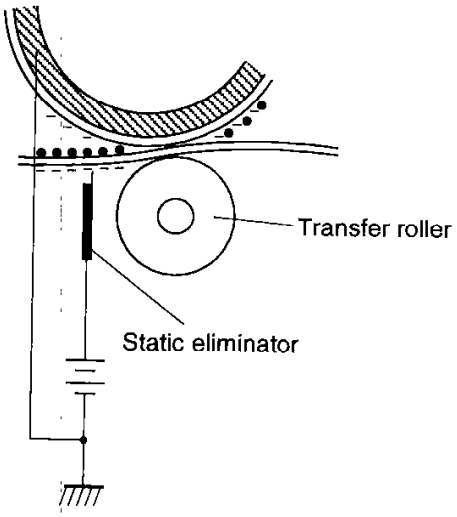

Figure 2-113

The copier uses a curvature separation method, which separates copy paper from the photosensitive drum by the rigidity of the paper. However, thin paper could at times fail to separate from the drum because of its low rigidity. To prevent such a problem, a positive charge is applied to the separation static eliminator, thereby weakening the static attraction for better separation.

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I. Step 7 (fixing)

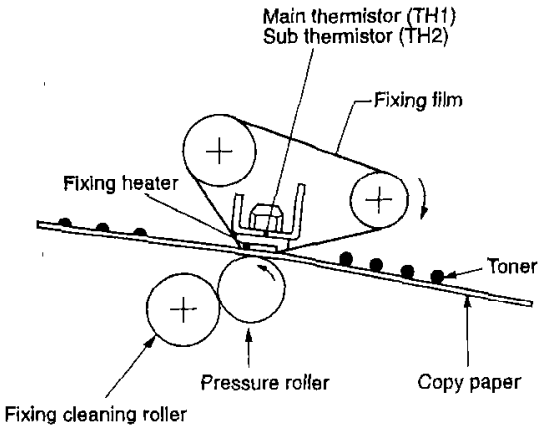

Figure 2-114

After transfer, the toner image is fused to the copy paper while the paper is moving between the fixing film and the pressure roller.

The fixing heater is a plane-shaped heater designed to heat the area of the fixing film that remains in contact, thereby eliminating warm-up time.

The temperature of the fixing heater is monitored by the main thermistor (TH1) located above the center of the fixing heater, and the heater is thermally controlled to a specific temperature.

In addition, the sub thermistor (TH2) found on the end of the fixing heater checks the temperature of the area where small-sized paper does not come into contact to prevent overheating. (See p. 3-48.) A fixing cleaning roller made of aluminum remains in contact with the pressure roller to remove toner from the pressure roller; it also serves to discharge heat of the pressure roller.

J. Step 8 (drum cleaning)

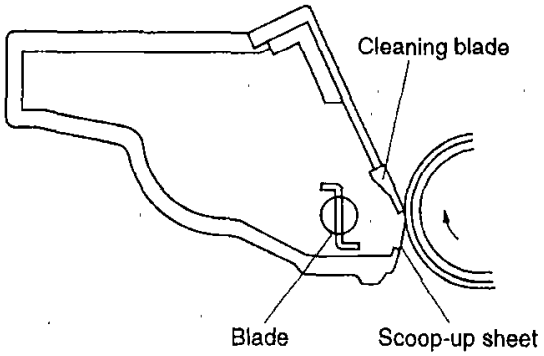

Figure 2-115

In this step, the cleaning blade scrapes off the toner remaining on the photosensitive drum in preparation for the next copy run. The toner is gathered by the scoop-up sheet and collected at the rear by a blade.

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II. AUXILIARY PROCESS

A. Blank Exposure

Blank exposure is executed to remove the drum surface potential of the non-image area that occurs as a result of the difference among copy sizes or when making copies in Reduce mode. (See p. 3-38.)

The light from the pre-exposure lamp is reflected by the reflecting plate and directed to the photosensitive drum.

The non-image area between sheets of copy paper is created by reflecting the light from the pre-exposure lamp by a separate reflecting plate, thereby exposing the whole area.

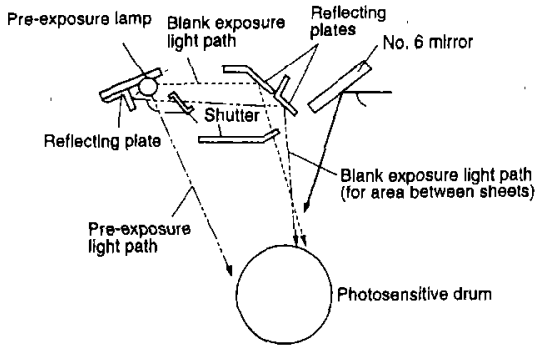

Figure 2-201

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I. BASIC CONSTRUCTION

A. Functional Construction

The copier may be divided into four blocks; namely, the pick-up/feeding system, exposure system, image formation system, and control system.

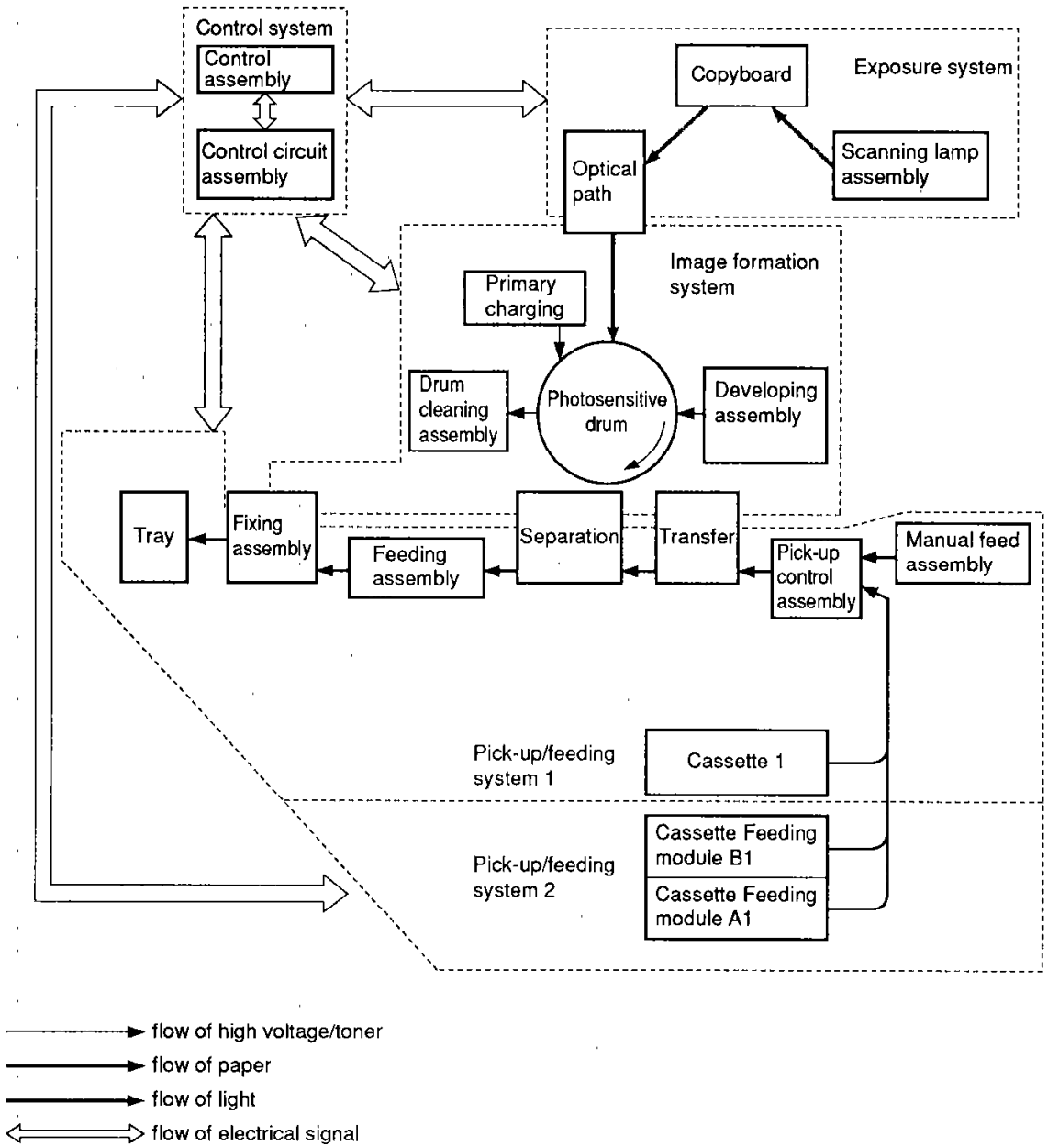

Figure 3-101

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B. Outline of the Electrical Circuitry

The copier's principal electrical mechanisms are controlled by the microprocessor on the DC controller PCB. The microprocessor reads the input signals from the sensors and operation keys according to the stored program and generates signals used to drive such loads as motors, solenoids, and lamps.

The microprocessor is capable of reading both digital and analog signals because of its built-in A/D converter.

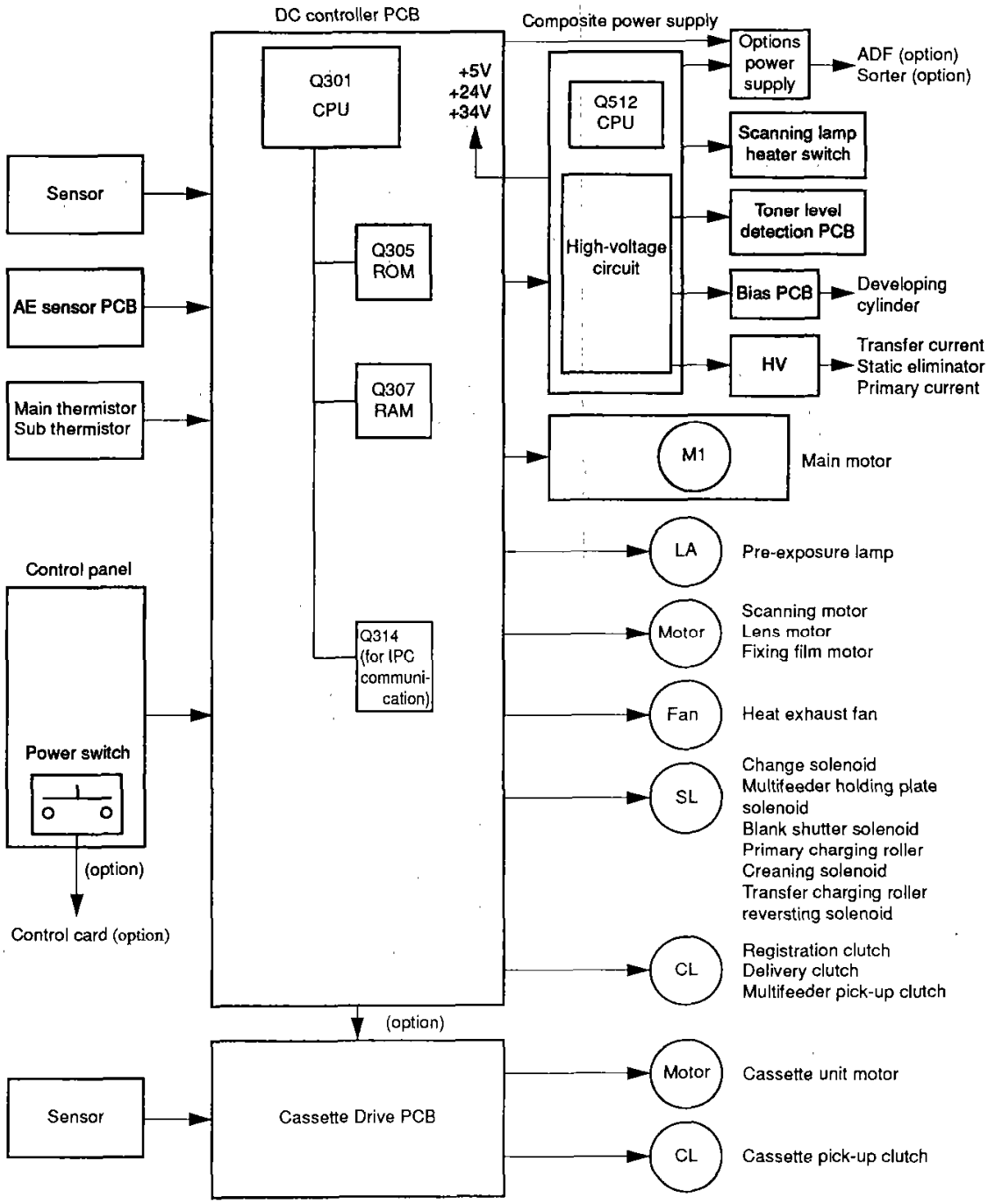

Figure 3-102

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C. Inputs to the DC Controller

1. Inputs to the DC Controller PCB (1/3)

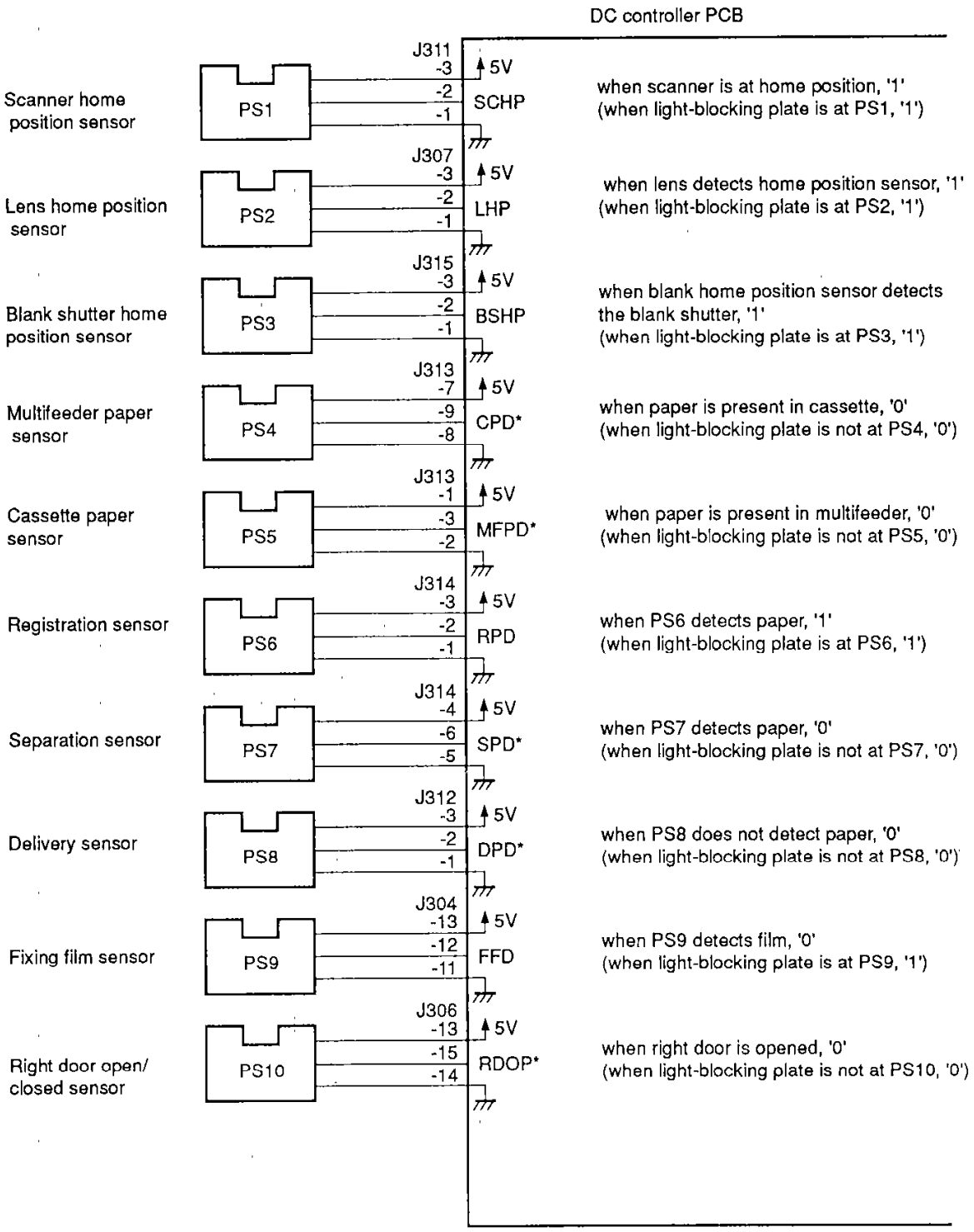

Figure 3-103

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2. Inputs to the DC Controller PCB (2/3)

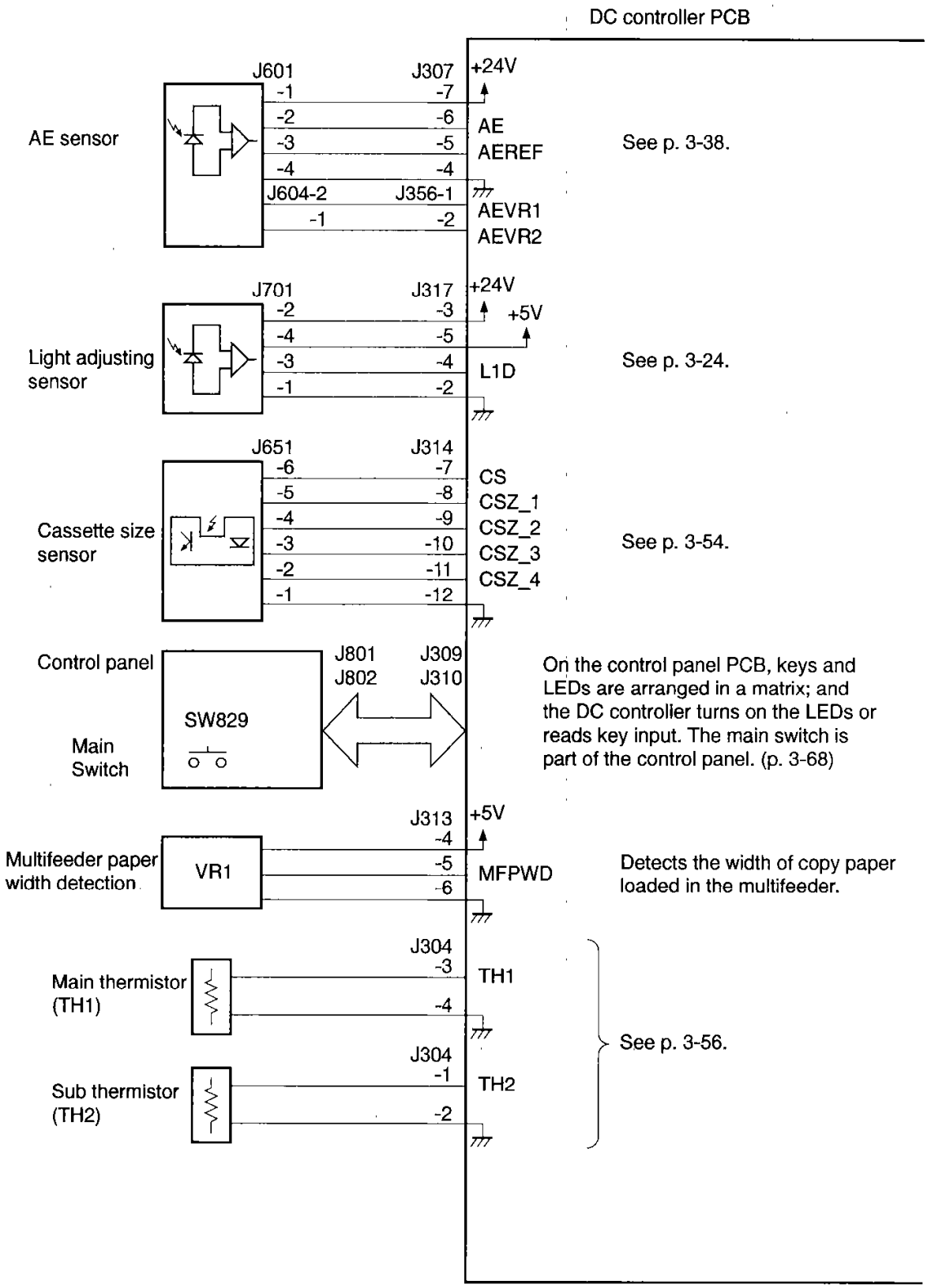

Figure 3-104

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3. Inputs to the DC Controller PCB (3/3)

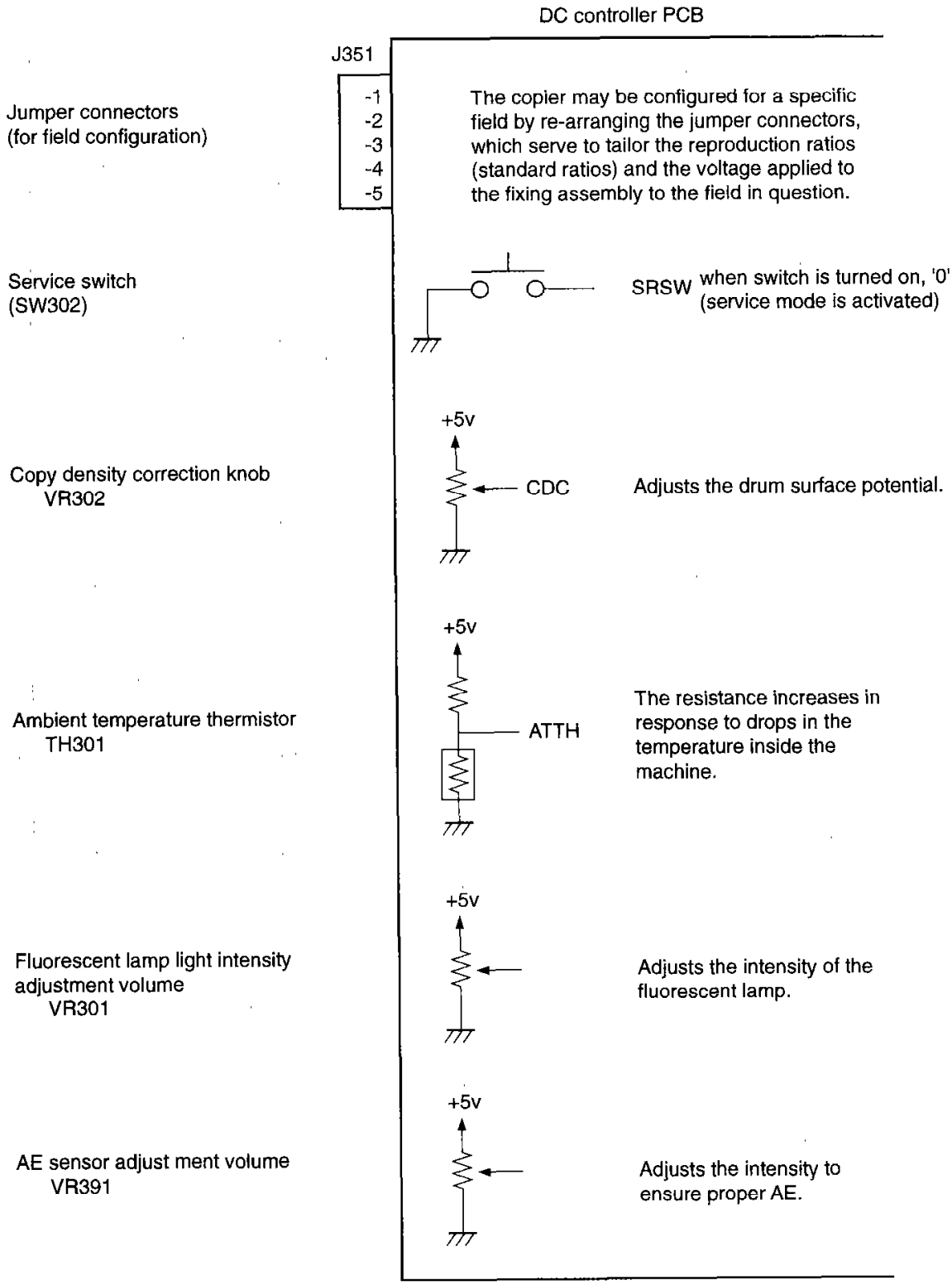

Figure 3-105

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D. Outputs from the DC Controller PCB

1. Outputs from the DC Controller PCB (1/3)

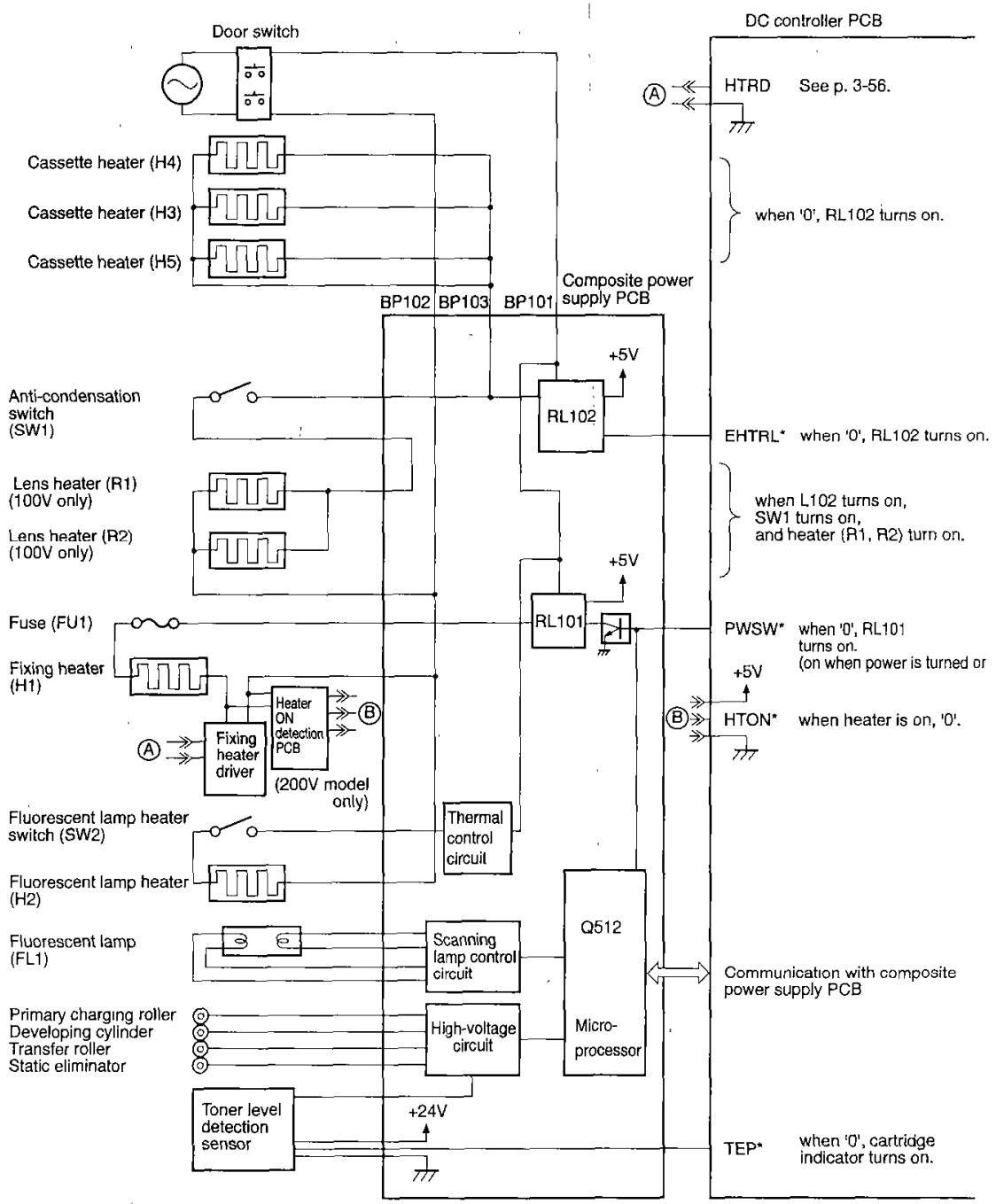

Figure 3-106

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2. Outputs from the DC Controller PCB (2/3)

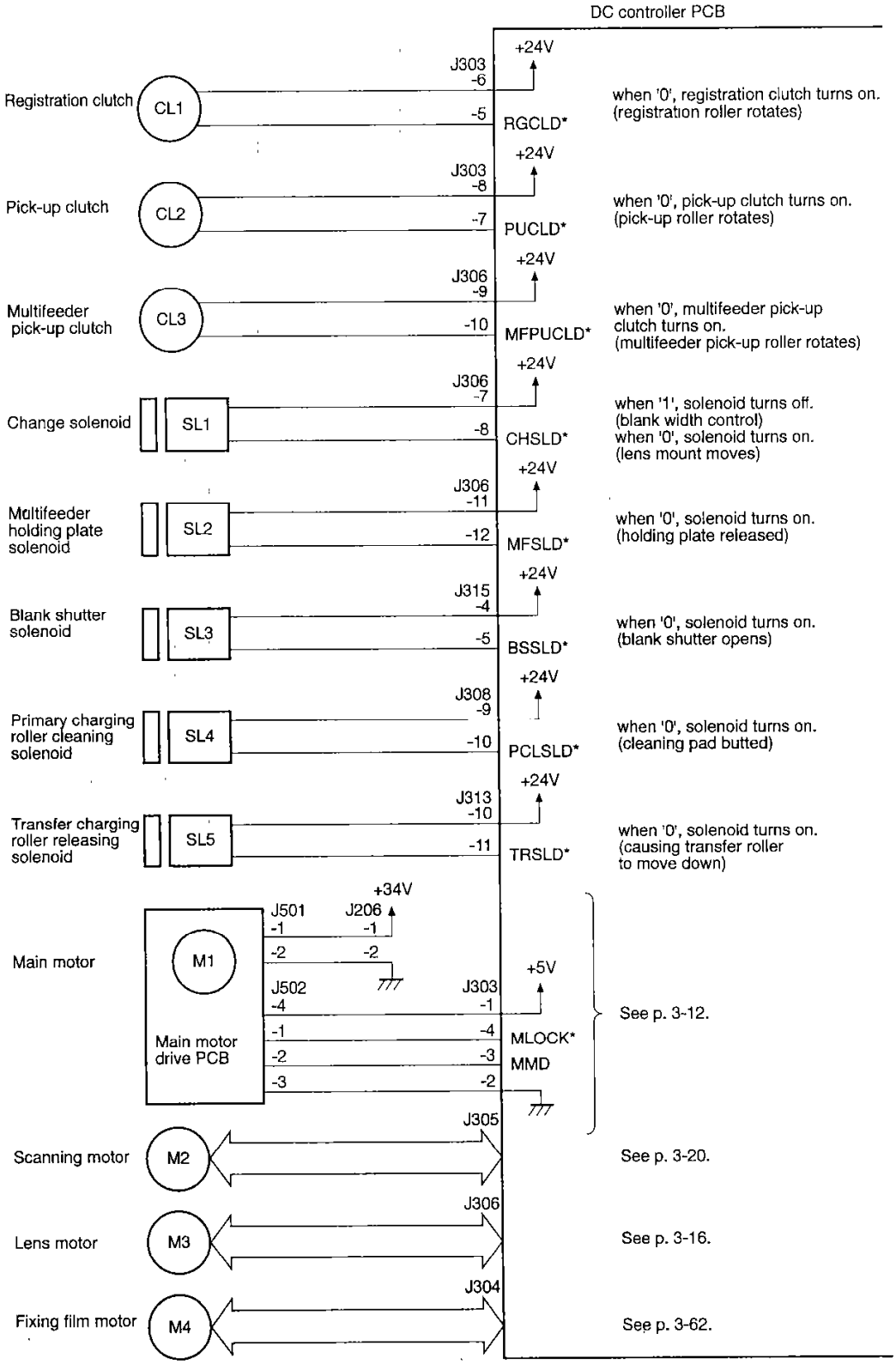

Figure 3-107

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3. Outputs from the DC Controller PCB (3/3)

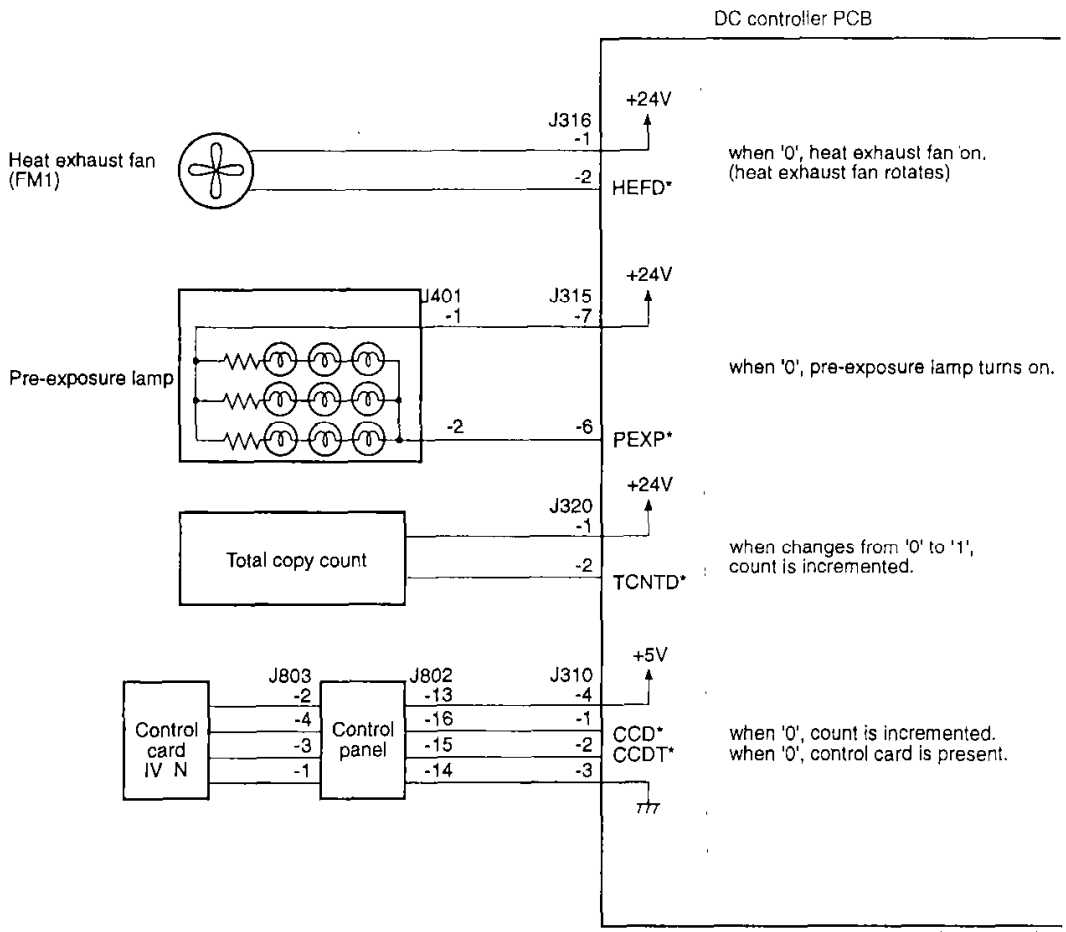

Figure 3-108

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E. Inputs to and Outputs from the 1-Cassette Unit Driver PCB

1. Inputs to and Outputs from the 1-Cassette Unit Driver PCB (1/1)

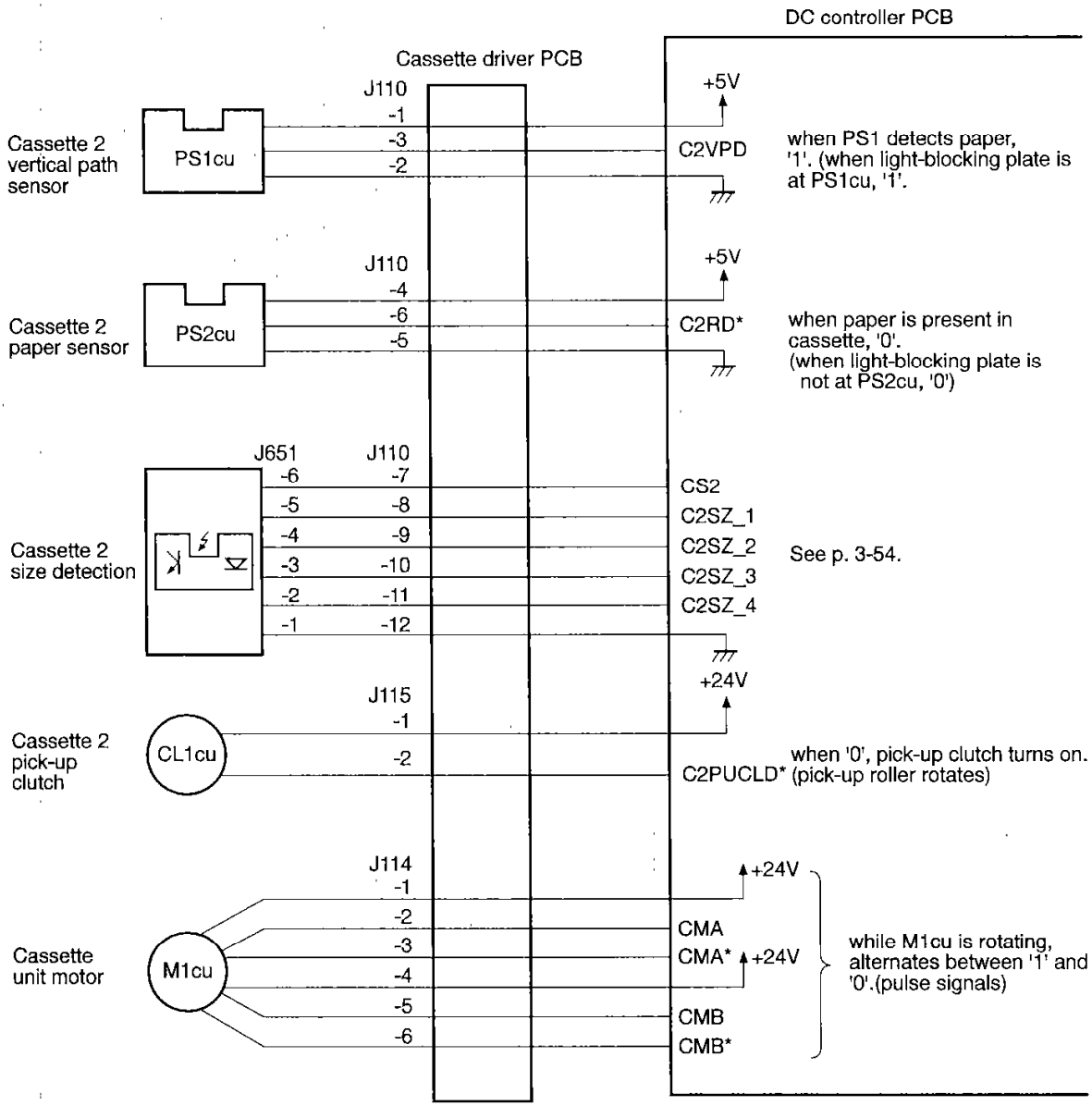

Figure 3-109

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F. Inputs to and Outputs from the 2-Cassette Unit Driver PCB

1. Inputs to and Outputs from the 2-Cassette Unit Driver PCB

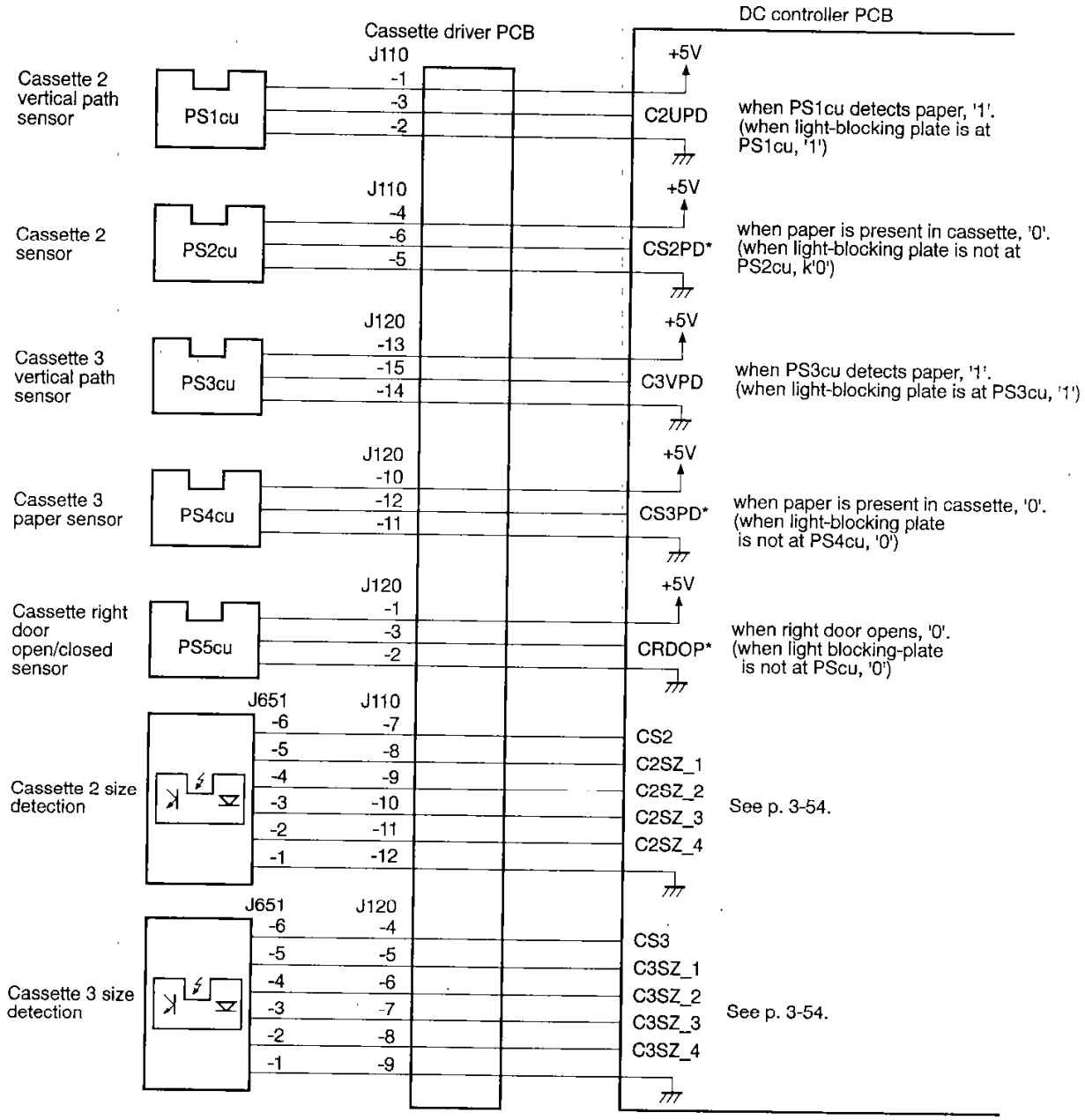

Figure 3-110

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2. Inputs to and Outputs from the 2-Cassette Unit Driver PCB (2/2)

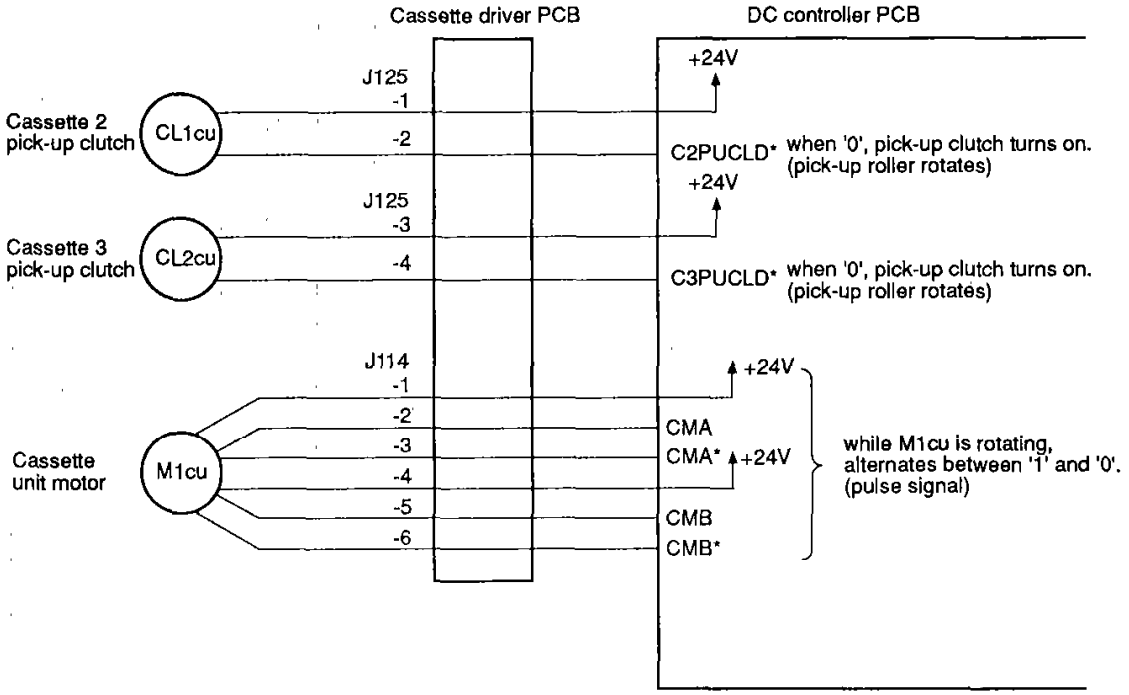

Figure 3-111

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G. Main Motor Control Circuit

1. Outline

Figure 3-112 shows the circuit used to control the main motor (M1); the circuit has the following functions:

① turns on and off the main motor.
② controls the main motor to a specific rotation speed.

The main motor (M1) is a DC motor that has a built-in clock pulse generator. When the motor rotates, it generates clock pulse signals (MMCLK*) according to the revolution of the motor. The speed control circuit matches the phases of the frequency of these clock pulses and that of the reference signals to control the main motor (M1) to a specific revolution speed.

2. Mechanism

When the main motor drive signal (MMD) from the DC controller circuit goes '1', the drive circuit of the motor driver turns on, thereby rotating the main motor (M1) at a constant speed.

While the main motor is rotating at a specific speed, the motor driver PCB keeps sending the specific speed state signal=0 (MLOCK*) to the DC controller PCB. If, for some reason, an irregularity occurs in the rotation of the main motor, the MLOCK* signal goes '1'.

If the main motor drive signal (MMD) remains '1' and the MLOCK*=0 remains unchanged for about 1 sec, the DC controller identifies a main motor error and stops the main motor and, at the same time, indicates 'E010'.

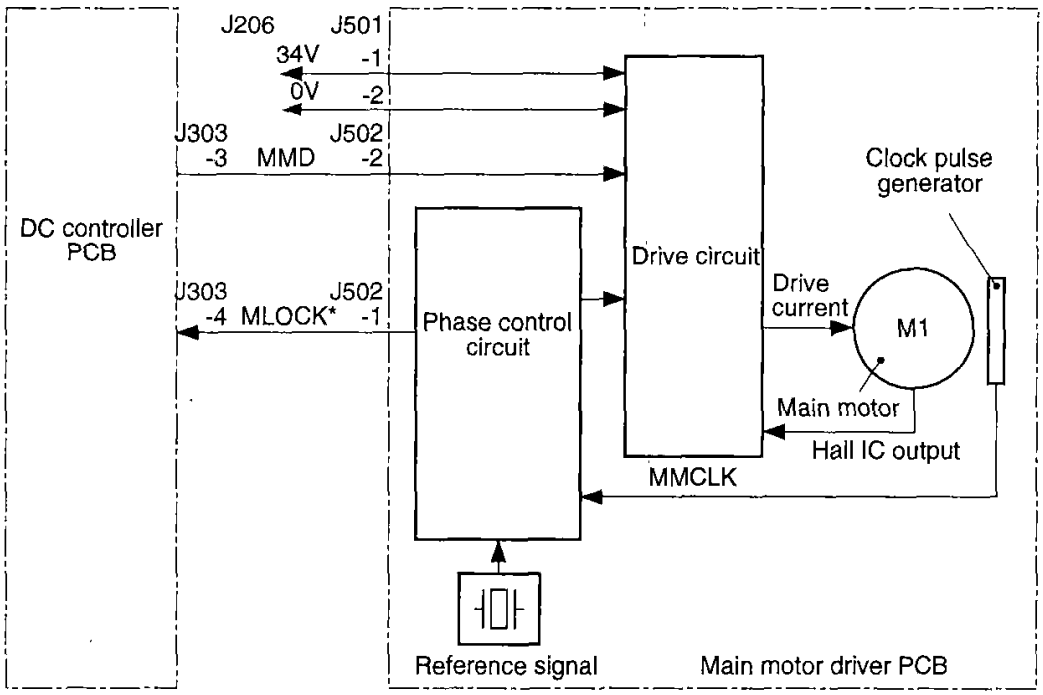

Figure 3-112

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H. Basic Sequence of Operations (2 copies continuous, AE)

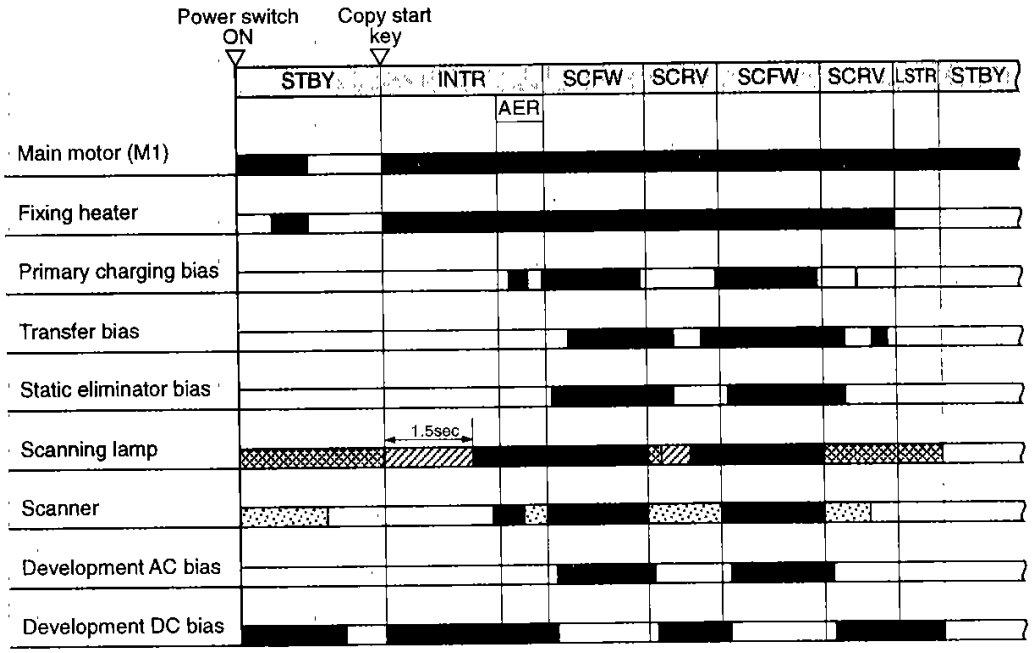

Figure 3-113

	Period	Description	Remarks
STBY (standby)	• Between when LSTR is over and when the Copy Start key is pressed or the Power switch is pressed. • Between when the Power switch has been pressed and when the Copy Start key is pressed.	Until the Copy Start key or another operation key is pressed.	• Upon completion of LSTR, the indications on the control panel return to indications for standard mode after 2 min.
INTR (initial rotation)	For at least 1 sec after the Copy Start key has been pressed.	The drum sensitivity is stabilized in preparation for a copy run.	
AER (AE rotation)		The scanner is moved about 65 mm forward and in reverse to measure the density of the original.	AE mode only.
SCFW (scanner forward)	While the scanner is moving forward. • The distance of forward travel varies depending on the cassette size and reproduction ratio. • The distance of reverse travel varies depending on the selected reproduction ratio.	The scanning lamp illuminates the original, and the reflected optical image is projected on the photosensitive drum through mirrors and lenses.	
SCRV (scanner reverse)	While the scanner is moving in reverse.	The scanner is returned to the home position in preparation for the next copy run.	The registration signal is generated to move the copy paper to the transfer assembly.
LSTR (last rotation)	Between when SCRV is over and when the copy paper moves past the delivery sensor.	The surface of the photosensitive drum is cleaned using static electricity as post treatment.	The last copy is discharged.

Table 3-101

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II. EXPOSURE SYSTEM

A. Varying the Reproduction Ratio

The reproduction ratio across the photosensitive drum is varied by the lens drive system; on the other hand, the ratio around the drum is varied by the scanner drive system.

The lens drive system uses a zoom lens; as shown in Figure 3-201, the position and focal distance of the lens are changed to vary the reproduction ratio across the photosensitive drum.

The scanner drive system varies the reproduction ratio around the photosensitive drum by moving the No. 1 mirror relatively faster (reduction) or slower (enlargement) than the peripheral speed of the photosensitive drum.

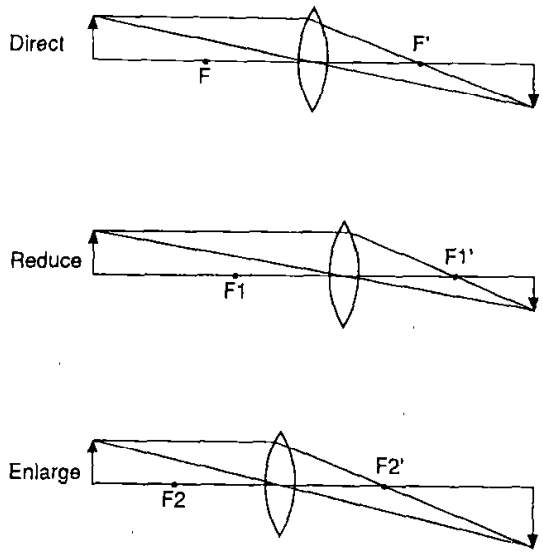

Figure 3-201

B. Lens Drive System

1. Outline

The lens drive system is driven by the lens motor (M3). The drive of the lens motor is transmitted to the blank exposure unit through a relay gear. (See p. 3-43.)

When the lens is moved, the solenoid (SL1) is turned on to engage the relay gear with the lens gear; when the lens motor rotates in the direction of the arrow in this condition, the lens is moved in the direction of enlargement (←) by the work of the relay lens gear and lens cable.

The blank exposure shutter, on the other hand, moves according to the distance traveled by the lens for reduction, thereby blanking (whiting) out the areas on both ends of the copy.

The copier's scanner lens home position sensor (PS2) is located at the center of the scanner lens drive rail so that the scanner lens home position may be detected early upon power-on, thereby speeding up the generation of the first copy. In addition, the scanning lens moves to the appropriate position in response to a press on each ratio button, thereby shortening the time it takes to generate the first copy.

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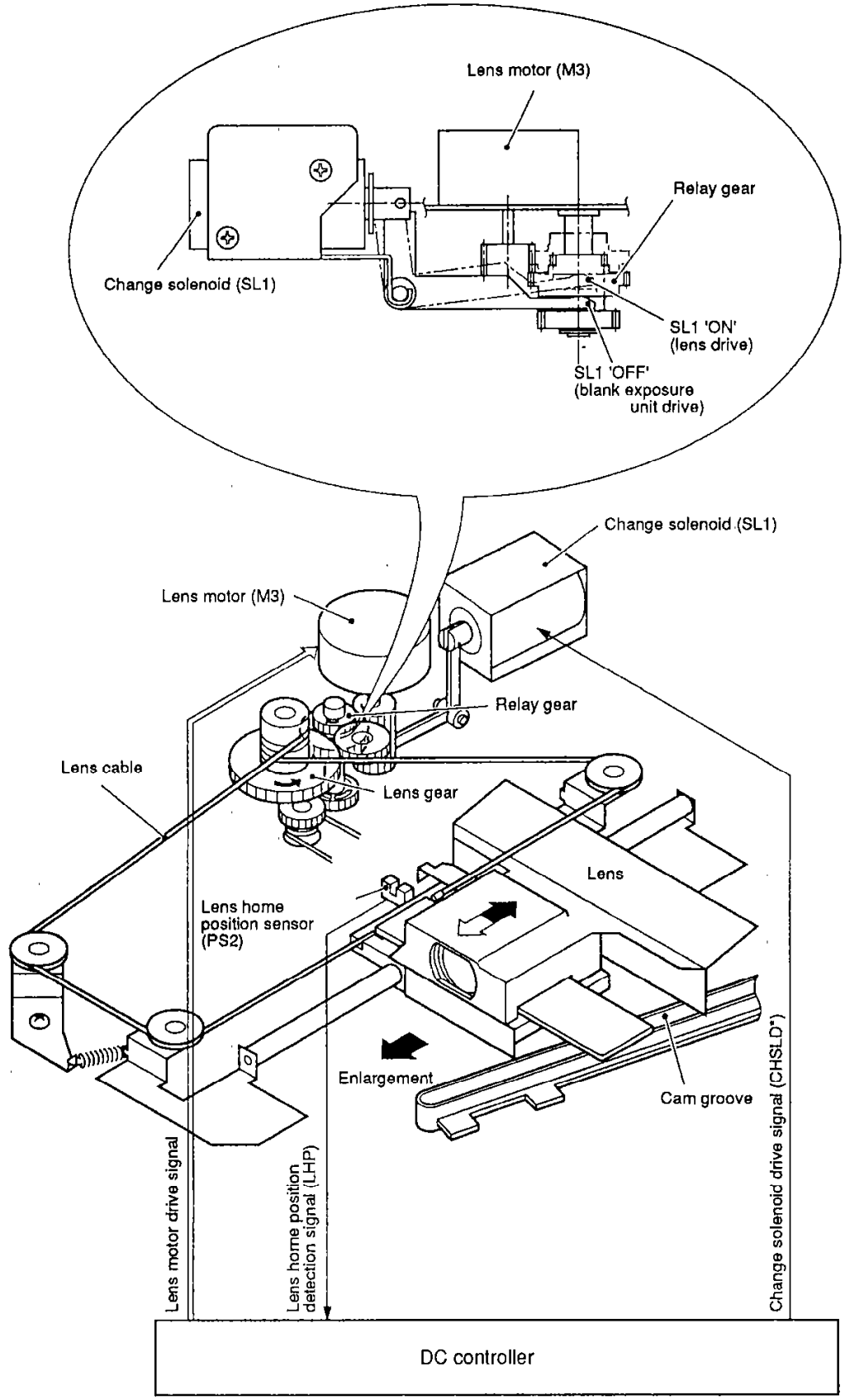

Figure 3-202

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2. Lens Motor Drive Circuit

The lens motor (M3) is a stepping motor and rotates in response to drive power LNSC-A and LNSC-B and pulse signals LNSA, LNSA*, LNSB, and LNSB*.

While the lens motor is rotating, the motor is driven by 34V to move the lens.

When the lens motor is at rest, 5 V is continuously applied to the motor so as to prevent displacement of the lens.

a. Keeping the Lens Motor Stationary

- LNSC-A=0
  when LNSC-B=0,
  └→ The motor drive voltage switching circuit switches to the 5V side.
  └→ 5V is supplied to the motor to retain stationary state.

At the time, all LNSA, LNSA*, LNSB, and LNSB* are caused to go '0', thereby stopping and retaining the motor stationary.

b. Driving the Lens Motor

- LNSC-A=1
  LNSC-B=1
  └→ The motor drive voltage switching circuit switches to the 34V side.
  └→ 34 V is supplied to the motor.

At the time, pulses are applied to each phase in sequence to rotate the motor.

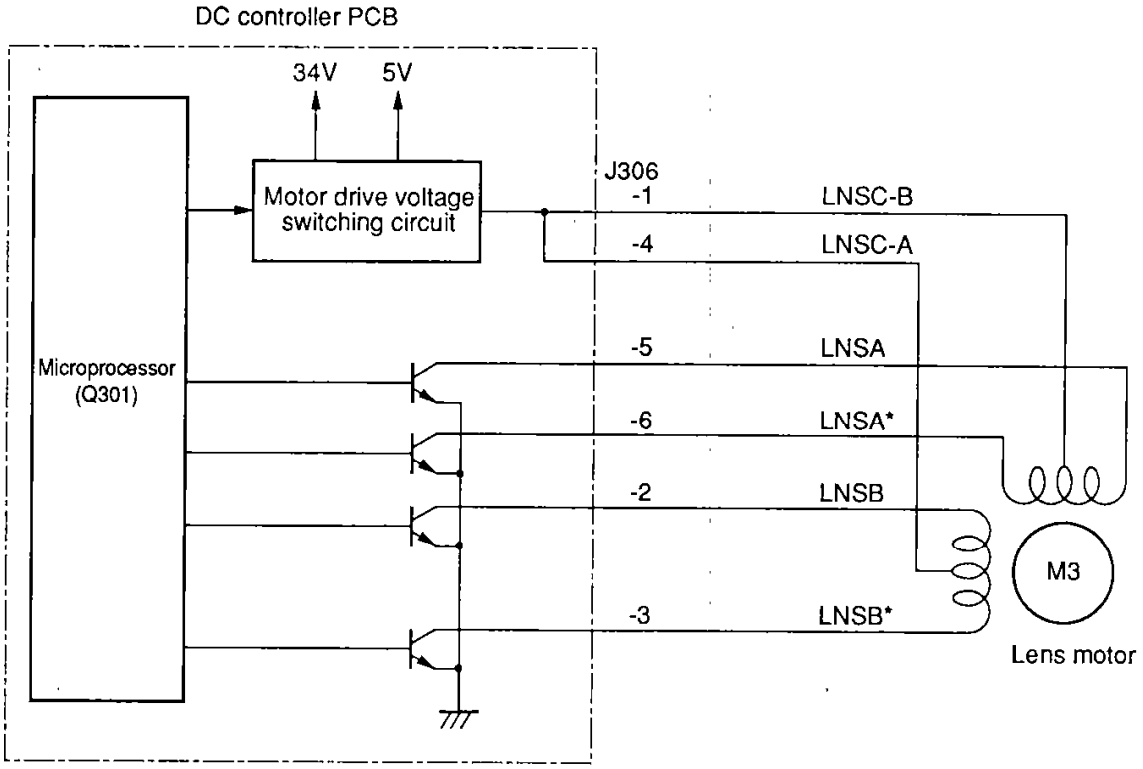

Figure 3-203

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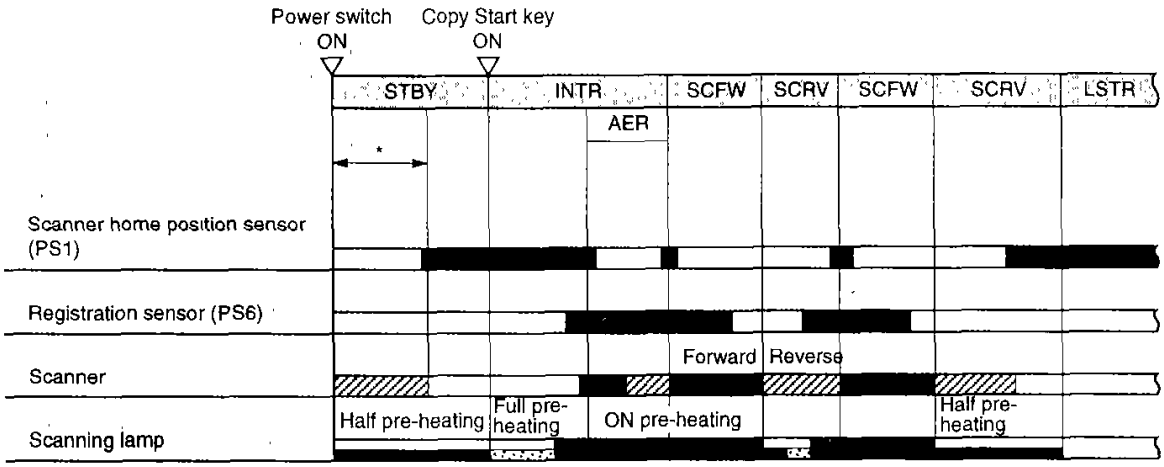
3. Basic Sequence of Operations (lens drive system; non-Direct)

When a specific reproduction ratio is selected, the lens always returns to the home position before moving to the position appropriate to the selected ratio. This also holds true when the reproduction ratio is reset to Direct.



*Unless it is at the home position already, the scanner returns to the home position at power-on.

Figure 3-204

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C. Scanning Drive System

1. Outline

The scanner drive system is driven by the scanner motor (M2). The scanner motor changes the direction of its rotation between when the scanner moves forward and when it moves in reverse; the speed of its rotation varies according to the selected reproduction ratio. However, the speed of its rotation remains constant regardless of the reproduction ratio when the scanner is moving in reverse; 2. 5 times as fast as when the scanner is moving forward.

The distance traveled by the scanner varies according to the length of copy paper and the selected reproduction ratio.

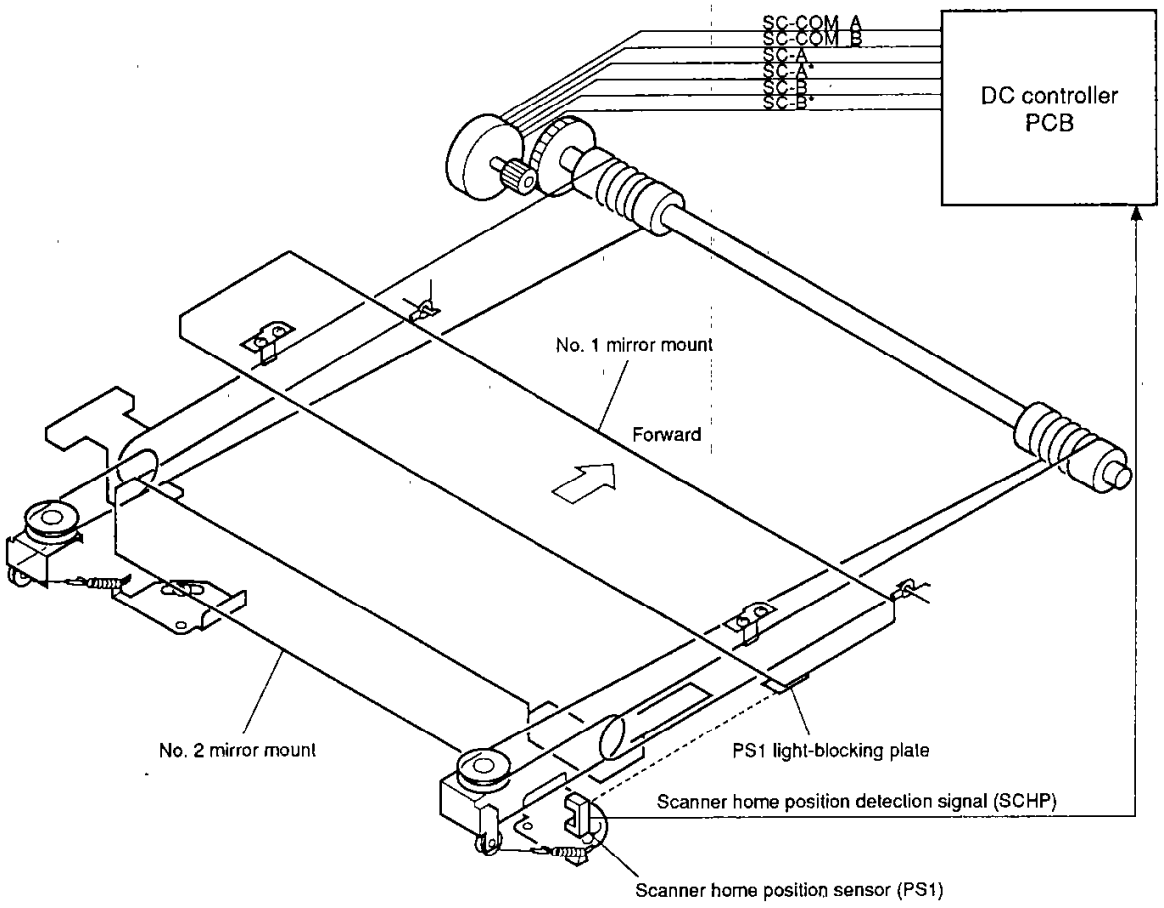

Figure 3-205

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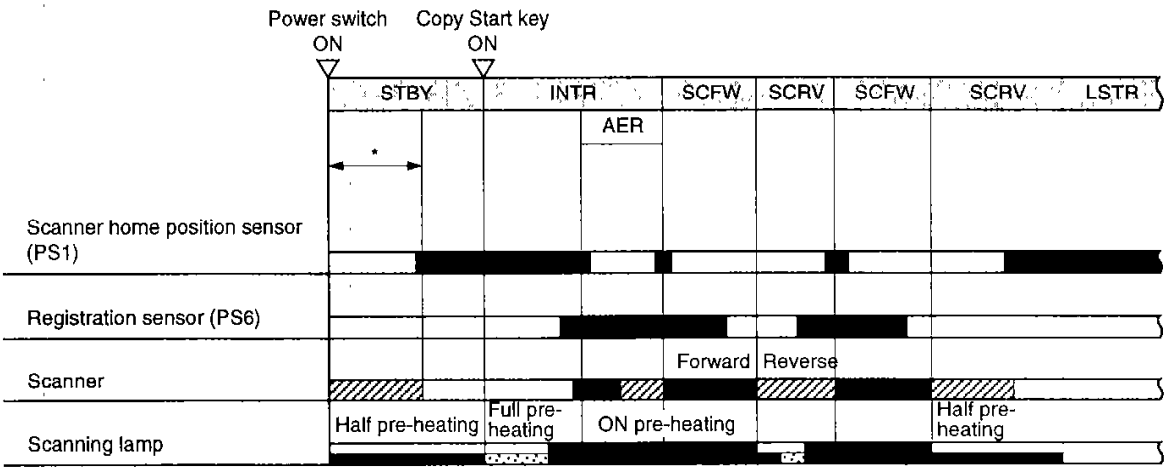
2. Relationship between the Scanner Sensor and Signals

Scanner sensor	Signal	Scanner		Description
		Forward	Reverse	
PS1 (scanner home position sensor)	SCHP	↓		Registration clutch turns on.
			↑	After 0.1 sec, the scanner stops moving in reverse.

Table 3-201

Reference:
The registration clutch is turned on in response to a press on the Copy Start key or when the scanner starts to move forward.

3. Basic Sequence of Operations (scanner)



*Unless it is at the home position already, the scanner returns to the home position at power-on.

Figure 3-206

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4. Driving the Scanner Motor

a. Outline

The scanner motor (M2) is a 4-phase control stepping motor. The direction and the speed of the scanner motor (M2) are switched by controlling the output timing of drive power SC-COMA and SC-COMB and pulse signals A, A*, B, and B*.

b. Mechanism

The microprocessor (Q301) on the DC controller PCB receives such instructions as on copy mode and reproduction ratio from the control panel circuit; in response, it sends drive pulses to the scanning motor (M2) through the motor drive circuit.

The scanner motor is a 4-phase control stepping motor, and is used to control the sequence of drive pulses (SC-A through SC-B*) and frequency, thereby controlling the direction of scans and speed.

The motor drive voltage ON/OFF switching circuit supplies or deprives the motor with or of power, thereby controlling the motor drive.

The current switching control circuit sets the current that flows through the motor according to the revolution, and the motor driver circuit controls the constant current according to the value that has been set.

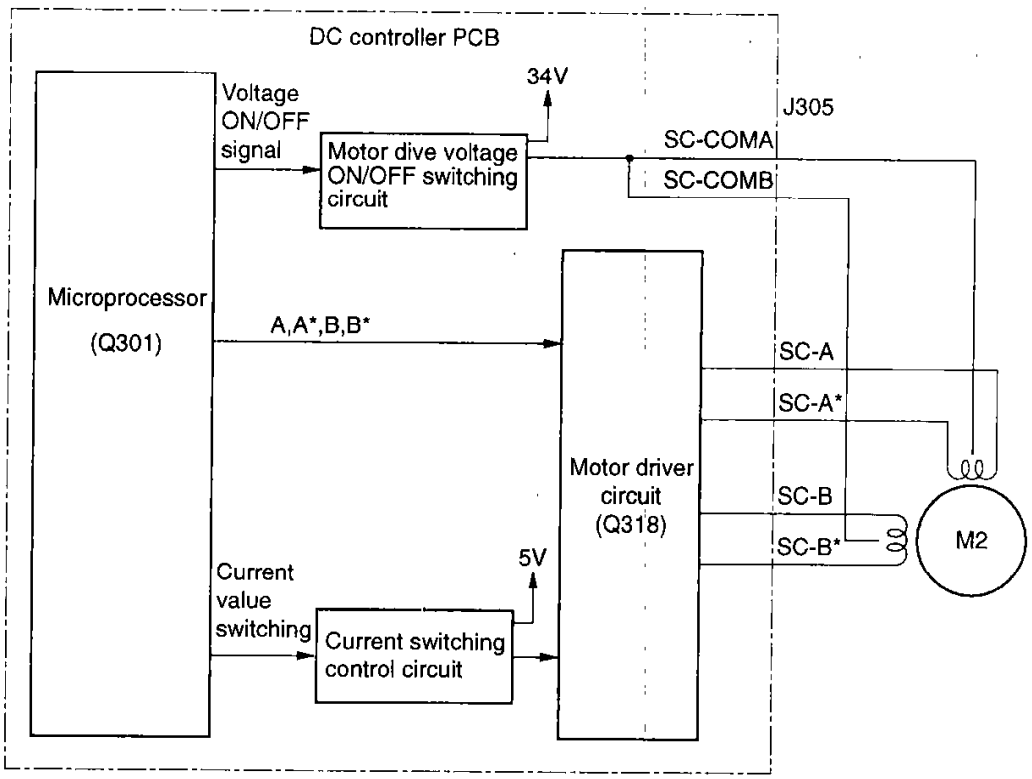

Figure 3-207

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D. Scanner Operations in Page Separation Mode (non-AE, page separation, A4, 2 copies)

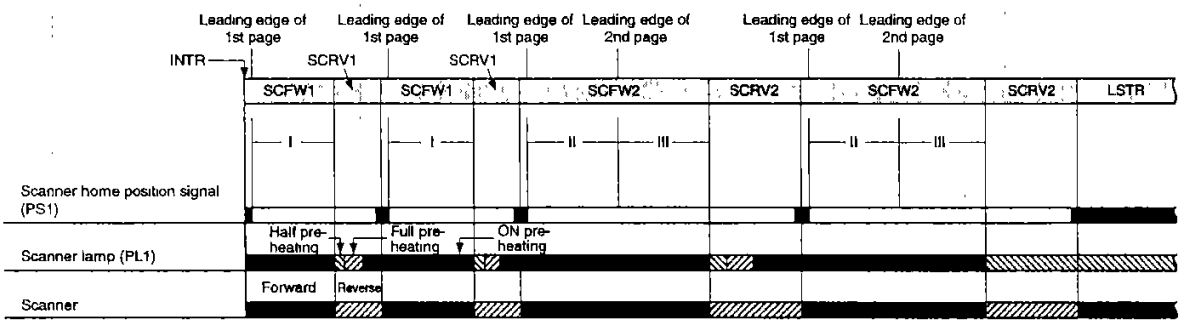

Figure 3-208

I, II, and III shown in Figure 3-208 are controlled by the microprocessor on the DC controller PCB with reference to the scanner home position signal (falling edge of SCHP) of the first original.

The microprocessor determines the distance to be traveled by the scanner according to the size of the selected cassette.

I, II: The distance traveled by the scanner is determined by the reproduction ratio and cassette size.

III: The copier does not have a mechanism that detects the size of originals; for this reason, control for page separation is exerted with reference to the size of the cassette.

If the distance traveled by the scanner forward (II in Figure 3-208) exceeds 216 mm (approx.), the copier assumes a point corresponding to 216 mm to be the leading edge of the second page.

The size of originals is checked only if an ADF (option) is installed.

The microprocessor identifies the result of dividing the identified size by 2 as the center of the original and operates the scanner assuming that the center represents the leading edge of the second original.

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III. IMAGE FORMATION SYSTEM

A. Outline

Figure 3-301 shows the basic construction of the copier's image formation system, whose main functions are as follows:

- scanning lamp control
- primary charging control
- transfer charging control
- separation static eliminator control
- developing bias control
- blank exposure lamp control

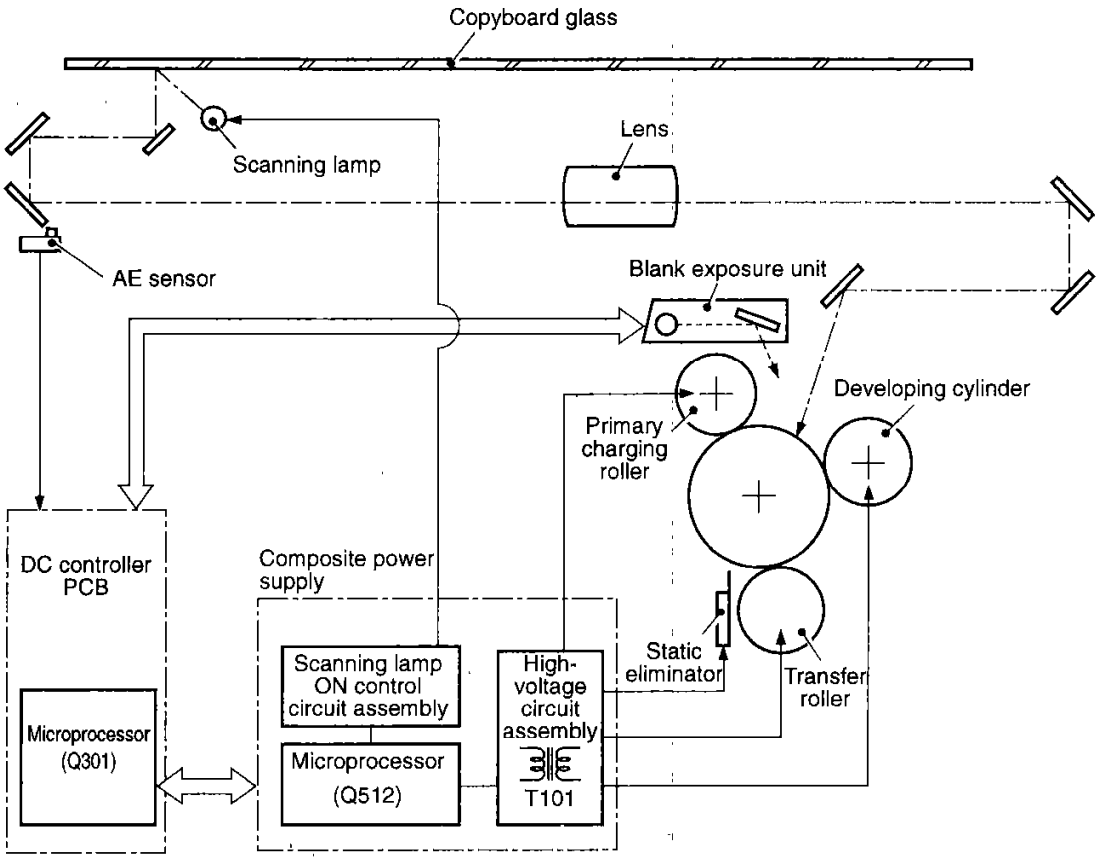

Figure 3-301

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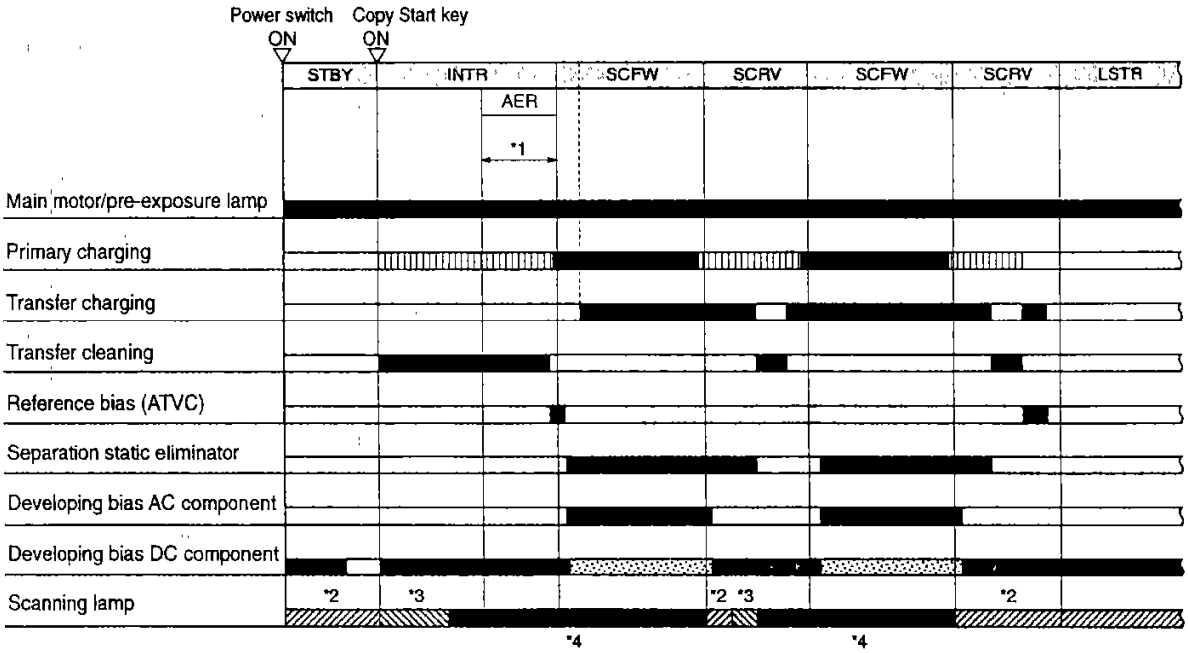
B. Basic Sequence of Operations (image formation system)



1 AE only.
2 half pre-heating control.
3 full pre-heating control.
4 ON pre-heating control.

Figure 3-302

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C. Controlling the Scanning Lamp

1. Outline

Figure 3-303 shows the circuit that controls the scanning lamp; the circuit has the following functions:

- turns on and off the scanning lamp.
- controls scanning lamp pre-heating operation.
- controls scanning lamp intensity.
- controls the scanning lamp heater.

The copier's scanning lamp is a fluorescent lamp.

In general, a fluorescent lamp is low in intensity immediately after power-on, gradually increasing in intensity as time passes, without control; in particular, it takes a long time before the intensity stabilizes in a low temperature environment.

If the ambient temperature drops below 15°C, the copier may enter and remain in wait state before a specific intensity can be obtained. To prevent this from occurring, a fluorescent lamp is provided for installation in low temperature environments.

To ensure that the lamp exposes an original at a stable intensity, a fluorescent lamp adjusting sensor is used to monitor the intensity of the lamp during copying operation, thereby controlling it to a specific value.

In addition, half pre-heating is executed between power-on and a press on the Copy Start key so as to ensure that the lamp reaches its optimum intensity within a short period of time after a press on the Copy Start key; thereafter, full pre-heating is performed. (See Figure 3-304.)

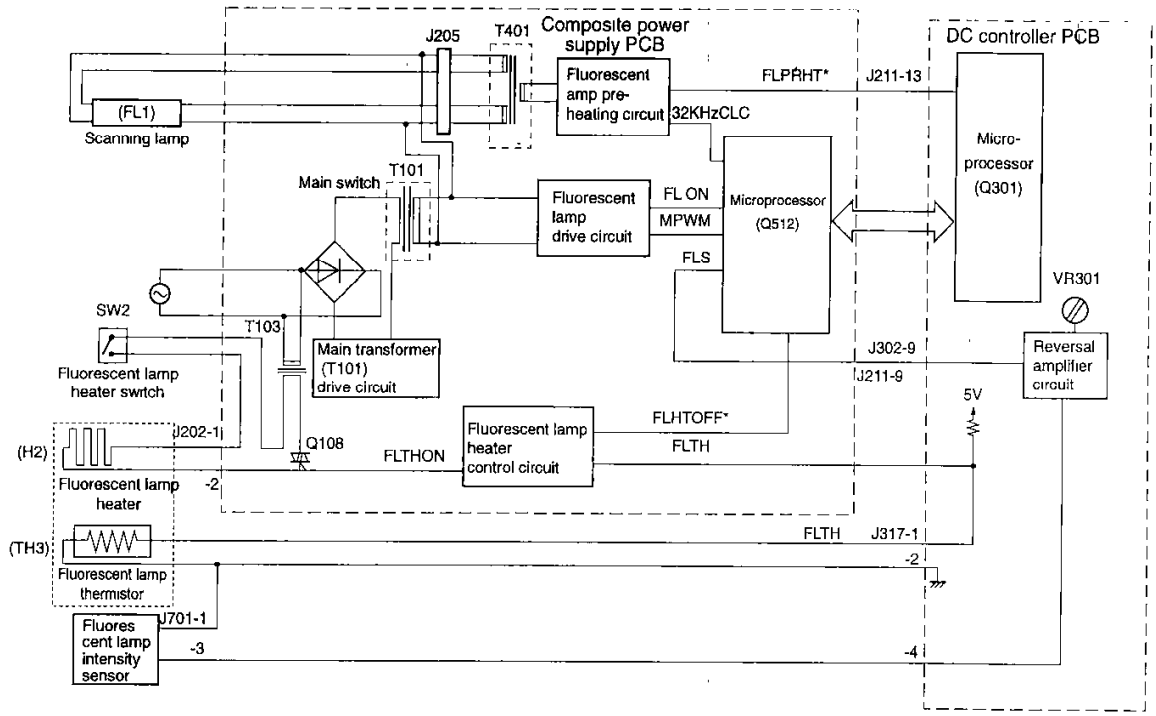

Figure 3-303

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2. Turning On and Off the Scanning Lamp

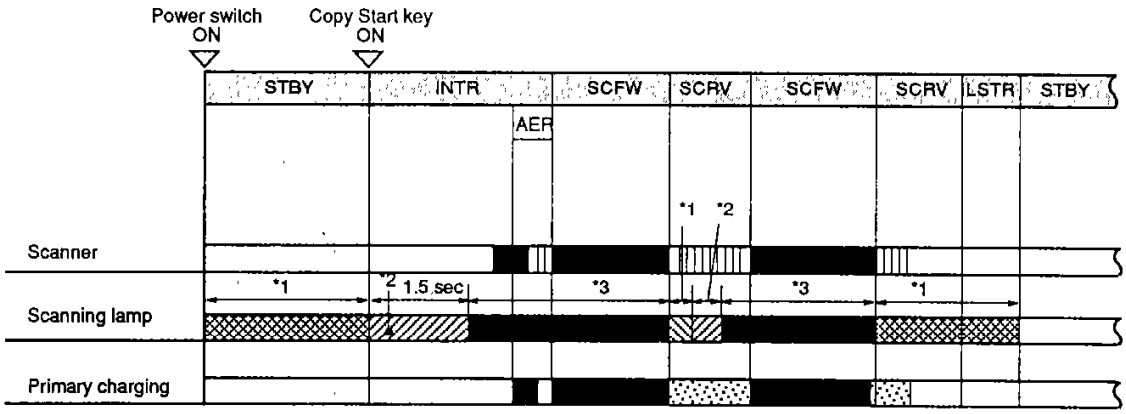
The microprocessor (Q301) on the DC controller PCB exerts control so that the microprocessor (Q512) on the composite power supply PCB generates the scanning lamp ON signal (FLON)=0 (pulse signal, 1 kHz). At the time, the fluorescent lamp drive circuit applies the output of the secondary side of the transformer (T101) to the scanning lamp (FL1), thereby allowing current to flow through the scanning lamp and causing the lamp to turn on at a high frequency (about 120 kHz).

3. Pre-Heating Control (scanning lamp)

The copier exerts four modes of control; namely, half pre-heating, full pre-heating, ON pre-heating I, and ON pre-heating II.

These modes of control are executed by the microprocessor (Q301) on the DC controller by varying the duty ratio of the fluorescent lamp pre-heat signal (FLPRHT; pulse) of 5 kHz to suit each pre-heat control mode sent to each scanning lamp pre-heat circuit. Based on the signal, the scanning lamp pre-heat circuit modulates the amplitude of the signal (32 kHz); in response, the secondary side of the transformer (T401) turns on to allow the fluorescent lamp pre-heat current to flow, thereby starting pre-heating operation. (For the sequence of operations, see Figure 3-304.)

4. Sequence of Operations (scanning lamp pre-heating control; AE, A4, continuous, 2 copies)



1 half pre-heating control.
2 full pre-heating control.
3 ON pre-heating I or II control.

Figure 3-304

■ Input Signals from the DC Controller to the Composite Power Supply PCB

	Half pre-heating	Full pre-heating	Fluorescent lamp ON I*	Fluorescent lamp ON II*
Duty ratio (5 kHz)	25.9 %	60 %	44.4 %	55 %
Filament voltage	2.5Vrms	4.5Vrms	3.6Vrms	4.1Vrms

*ON duty ratio of FLOW signal (in relation to 1kHz):
40% or more ..... ON I
less than 40% ..... ON II

Table 3-301

■ Half Pre-Heating Control (between press on Power switch and press on Copy Start key; part of scanner reverse travel)

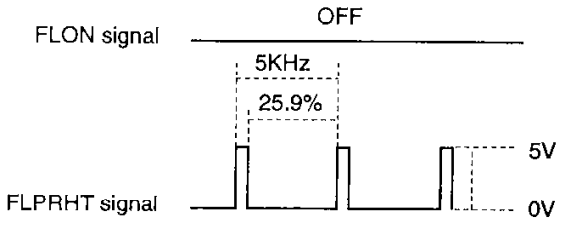


Figure 3-305

■ Full Pre-Heating Control (initial rotation, last rotation, part of scanner reverse travel)

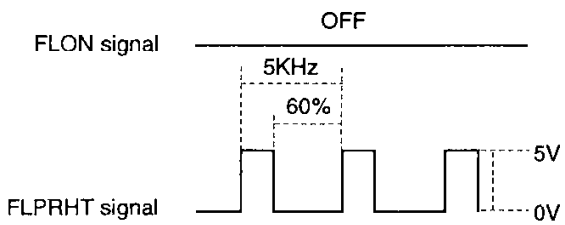


Figure 3-306

■ Scanning Lamp ON Pre-Heating Control (during copying operation I)

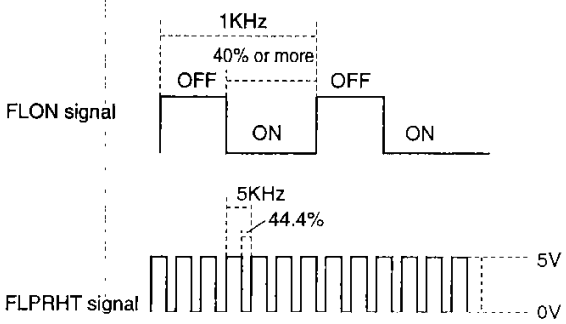


Figure 3-307

5. Controlling the Intensity of the Scanning Lamp (FL1)

- If the intensity of the fluorescent lamp is too low at power-on,
  The starting power of the intensity adjustment sensor lowers, and the fluorescent lamp intensity adjustment signal (FLS) of the amplifier circuit on the DC controller increases.
  In response to the signal, the microprocessor (Q512) on the composite power supply PCB reduces the duty ratio, thereby increasing the ON time of the FLON signal.
  The current flows through the filament of the fluorescent lamp when both the MPWM signal (150 kHz) and the FLON signal (1 kHz) are on.
- If the intensity of the fluorescent lamp is too high at power-on,
  The starting power of the intensity adjustment sensor rises, and the fluorescent lamp intensity adjustment signal (FLS) of the amplifier circuit on the DC controller PCB decreases. In response to the signal, the microprocessor (Q512) on the composite PCB increases the duty ratio, thereby decreasing the ON time of the FLON signal.

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Caution:
Gain Adjustment for the Intensity Adjustment Sensor (VR301)
If you replaced the intensity adjustment sensor or the scanning lamp (fluorescent lamp, FL1), or the DC controller PCB, you must always perform gain adjustment for the intensity adjustment sensor using VR301 on the DC controller PCB. (See the Service Handbook.)

■ *Input to the Reversal Amplifier Circuit (if the intensity increased gradually)*

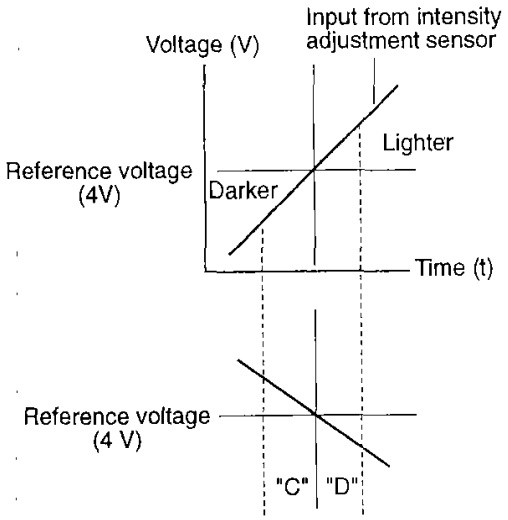

Figure 3-308

■ Changes in the Duty Ratio of the FLON signal

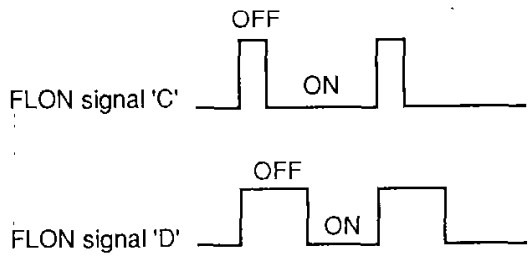

Figure 3-309

6. Controlling the Fluorescent Lamp Heater

As the temperature around the scanner increases, the resistance of the fluorescent lamp thermistor (TH3) lowers, thereby lowering the voltage of the fluorescent lamp thermal signal (FLTH). Based on the voltage, the fluorescent lamp heater control circuit on the composite power supply PCB turns on and off the fluorescent lamp heater drive signal (FLTHON).

You can force the fluorescent heater off by turning off the scanning lamp (fluorescent lamp) heater switch (SW2) during the months in which the heater is not needed.

7. Fluorescent Lamp Automatic Correction Control (ALVC control)

The copier executes control (ALVC control) that automatically corrects the scanning lamp on voltage to make up for the change that otherwise could occur as a result of deterioration of the photosensitive drum.

8. Fluorescent Lamp Protection Mechanism (200V model only)

If the fluorescent lamp fails or flickers continuously after copying is started, the microprocessor on the DC controller increases the application voltage to turn on the lamp properly.

This, however, imposes an excessive voltage to the fluorescent lamp, speeding up its deterioration. To prevent such a problem, the DC controller turns off the power when an error in the application voltage is detected on the composite power supply PCB (In the case of the 100V model, 'E220' is indicated.).

Reference:
If the same problem occurs when the power is returned, the fluorescent lamp may be faulty. Try replacing it.

Warning:
Do not execute operations that turn on the fluorescent lamp (coying, service mode) without installing the fluorescend lamp.

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D. Controlling the Primary Charging Roller Bias

1. Outline

Figure 3-310 shows the circuit that controls the voltage applied to the primary charging roller; the circuit has the following functions:

- turns on and off the primary charging roller bias.
- controls the primary charging roller bias to a constant voltage.
- switches the application voltage level for the primary charging roller bias.
- switches the application voltage level for the primary charging roller bias.
- corrects the scanning lamp on voltage level

The main transformer (T101) is driven by the drive signal (MPWM) generated by the main transformer (T101).

The main transformer (T101), further, is used also as the high voltage transformer for the DC power supply and others in addition to providing the above functions.

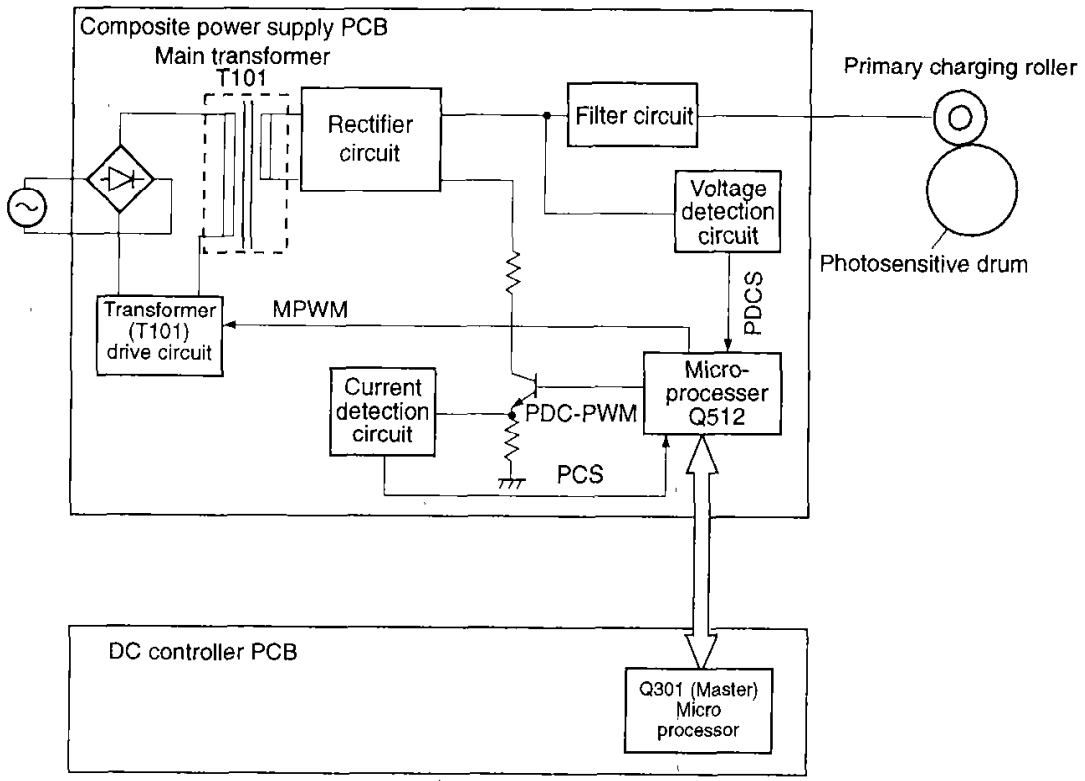

Figure 3-310

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2. Turning On and Off the Primary Charging Roller Bias

The microprocessor (Q512) on the composite power supply PCB generates the PDCPWN signal (pulse signal) under the control of the microprocessor master (Q301) on the DC controller PCB. In response to the signal, the secondary side of the main transformer (T101) turns on to apply a primary charging roller bias.

The main transformer (T101) is driven by the drive signal (MPWM) from the microprocessor (Q512). The main transformer (T101) is also used as the high-voltage transformer for the DC power supply and other loads.

3. Controlling the Primary Charging Roller Bias to a Constant Voltage

While a bias voltage is being applied to the primary charging roller, the microprocessor (Q512) on the composite power supply PCB reads the PDCS signal (analog signal) from the voltage detection circuit to control the PDCPWM signal so that the output voltage is maintained at a specific level.

4. Switching the Primary Charging Roller Bias Application Voltage Level

The copier applies a cleaning bias to the transfer roller during initial rotation (INT), while the scanner is moving in reverse (SCRV), and during last rotation, thereby cleaning the transfer charging roller. (See p. 3-46.)

To enhance the result of cleaning by the cleaning bias and to prevent drum memory caused by the cleaning bias, a cleaning primary charging roller bias is applied during initial rotation and while the scanner is moving in reverse.

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5. Application Voltage Level (APVC) for the Primary Charging Roller and Scanning Lamp On Voltage Level Automatic Correction

Changes in the static latent image could cause the quality of copies; such changes, in turn, may be attributed to the following factors:

- changes in the drum sensitivity
- changes in the charge volume of the primary charging roller.

These changes occur as a result of changes in the environment in which the copier is installed (temperature, humidity), deterioration of parts, or wear and dirt on parts.

In the case of the copier, the *light* potential (V_L) and *dark* potential (V_D) tend to increase, and the primary charging roller bias application voltage level is corrected (APVC control) to compensate for possible problems while at the same time executing scanning lamp on voltage level correction (ALVC control); specifically, the control serves to ensure constant *light* potential (V_L) and *dark* potential (V_D).

See the following for the flow of operations that occur after the power is switched on and during initial rotation:

- Flow

A constant voltage of about –1.46 kV is applied to the primary charging roller for about 1.5 sec.

↓

The current at the time is measured by the current detection circuit, and the result is sent to the microprocessor (Q512).

↓

The microprocessor (Q512), in turn, sends the result to the microprocessor (Q301) on the DC controller, which determines the application voltage for the primary charging roller bias based on the input.

Caution:
You must store the APVC value recorded on the label attached to the composite power supply PCB in service mode whenever you have replaced the composite power supply PCB. (See p. 3-83.)

Caution:
You must enter the APVC correction voltage setting recorded on the label attached to the front of the drum unit whenever you have replaced the drum unit. (See the Service Handbook.)

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E. Controlling the Transfer Roller Bias

1. Outline

The copier uses a direct transfer method by a roller to transfer images to paper. For this reason, its bias control differs from that of conventional copiers, which transfer images by corona charging.

The following three types of transfer roller bias are used; go through the descriptions for the function and output timing of each.

a. Transfer Bias

This bias corresponds to the transfer bias of conventional copiers, and is a negative voltage (constant voltage, –3.5 kV to –6.0 kVDC).

b. Cleaning Bias

Since the copier uses a direct transfer method, jams could cause toner on the photosensitive drum to deposit itself on the transfer roller.

To remove such deposits of toner, the copier applies a positive voltage (constant voltage, DC) at the following timing, thereby returning the toner from the transfer roller to the photosensitive drum.

Cleaning Bias Output Timing

- during initial rotation after a press on the Copy Start key
- while the scanner is moving in reverse (certain period)
- during last rotation (certain period)

c. Reference Bias (ATVC)

Changes in the environment or deterioration of the transfer roller can affect the resistance of the transfer roller, ultimately affecting the transfer efficiency.

To limit the changes in the image quality brought about by such changes in the transfer efficiency, the copier corrects the application voltage level of the transfer bias.

The transfer ATVC bias (constant current, –10 µA DC) is the bias applied to determine the correction value each time the Start button is pressed.

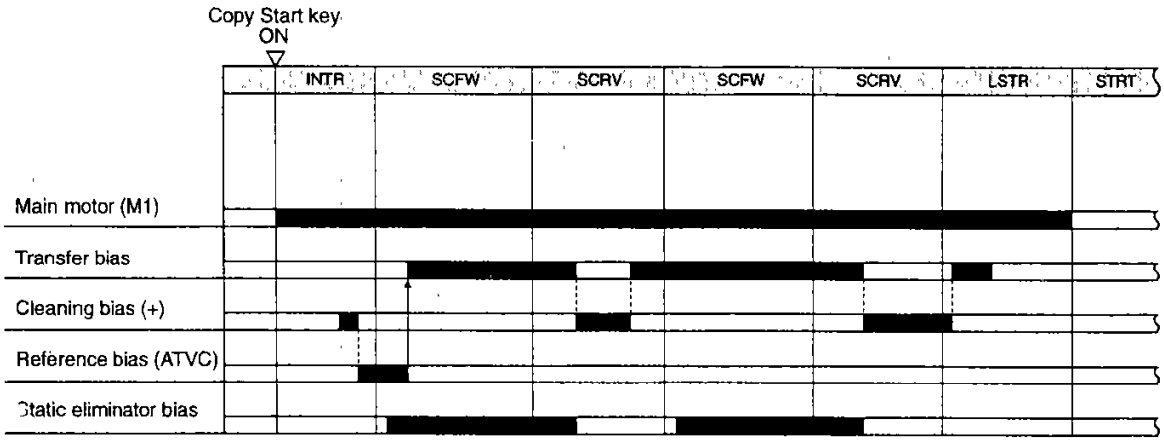

Figure 3-311

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Figure 3-312 shows the circuit used to control the foregoing three types of bias; the circuit has the following functions:

- turns on and off the transfer roller bias
- controls the transfer bias to a constant voltage
- controls the correction of the transfer bias voltage level

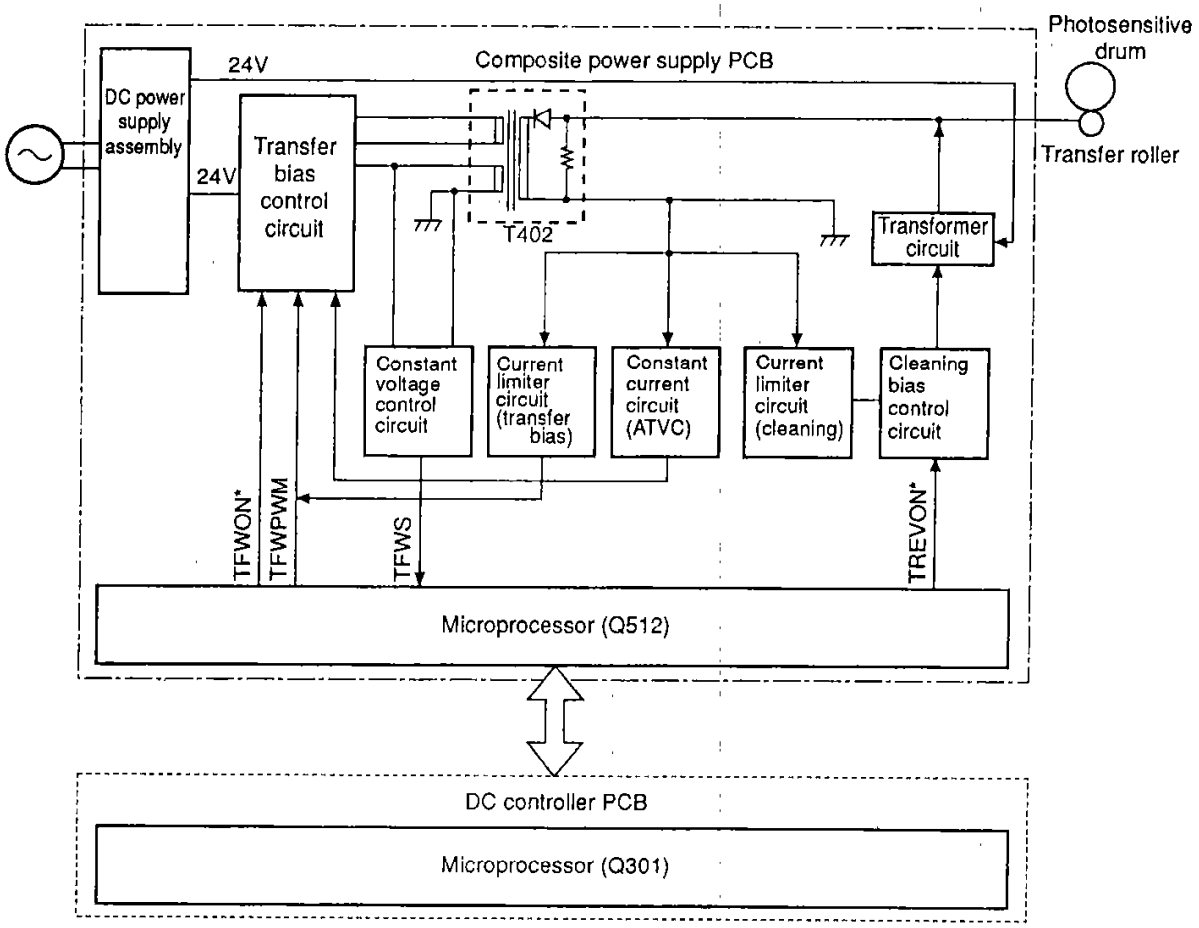

Figure 3-312

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2. Turning On and Off the Transfer Roller Bias

The TFWON signal is generated under the control of the microprocessor (Q512) on the composite power supply PCB. The signal causes the secondary side of the transfer transformer (T402) to turn on, thereby applying a DC bias to the transfer roller.

Table 3-302 shows combinations of signals that are used when determining the transfer roller bias.

	TREVON*	TFWON*	TFWPWM
Transfer bias output	OFF	ON	ON
Cleaning bias output	ON	OFF	OFF
Reference bias output (ATVC)	OFF	ON	OFF

Table 3-302

3. Controlling the Transfer Bias to a Constant Voltage

While the transfer DC bias is being generated, the microprocessor (Q512) on the composite power supply PCB reads the TFWS signal (analog signal) from the constant voltage control circuit and changes the duty ratio so that the application voltage is maintained at a constant level, thereby controlling the TFWPWM signal.

4. Controlling the Transfer Bias Voltage Level Correction (ATVC control)

To correct the changes in the transfer efficiency caused by changes in the environment or deterioration of the transfer roller, the application voltage level of the transfer bias is corrected automatically.

A constant current (–10 μA) is let to flow during initial rotation after a press on the Copy Start key.

The microprocessor (Q512) on the composite power supply PCB takes in the transfer roller application voltage at the time from the constant voltage control circuit, and sends the data to the microprocessor (Q512) on the DC controller; the DC controller, in turn, determines the level of the voltage to be applied to the transfer roller based on the data.

This control is executed only once during initial rotation immediately after a press on the Copy Start button; for this reason, the application voltage will never vary during continuous copying operation.

5. Current Limiter Circuit (transfer bias)

Should an overcurrent flow to the secondary side of the transformer (T402) while a transfer bias is being generated because of changes in the environment, the current limiter circuit exerts control so as to prevent any occurrence of a current which is 50 μA or more.

6. Current Limiter Circuit (cleaning bias)

Should an overcurrent flow to the secondary side of the transformer (T402) while a transfer bias is being generated, the current limiter circuit exerts control to prevent any occurrence of a current which is 10 μA or more.

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F. Controlling the Static Eliminator Bias

1. Outline

Figure 3-313 shows the circuit that controls the static eliminator bias; the circuit has the following functions:

- turns on and off the static eliminator bias and controls the voltage to a constant level
- switches the static eliminator bias voltage level

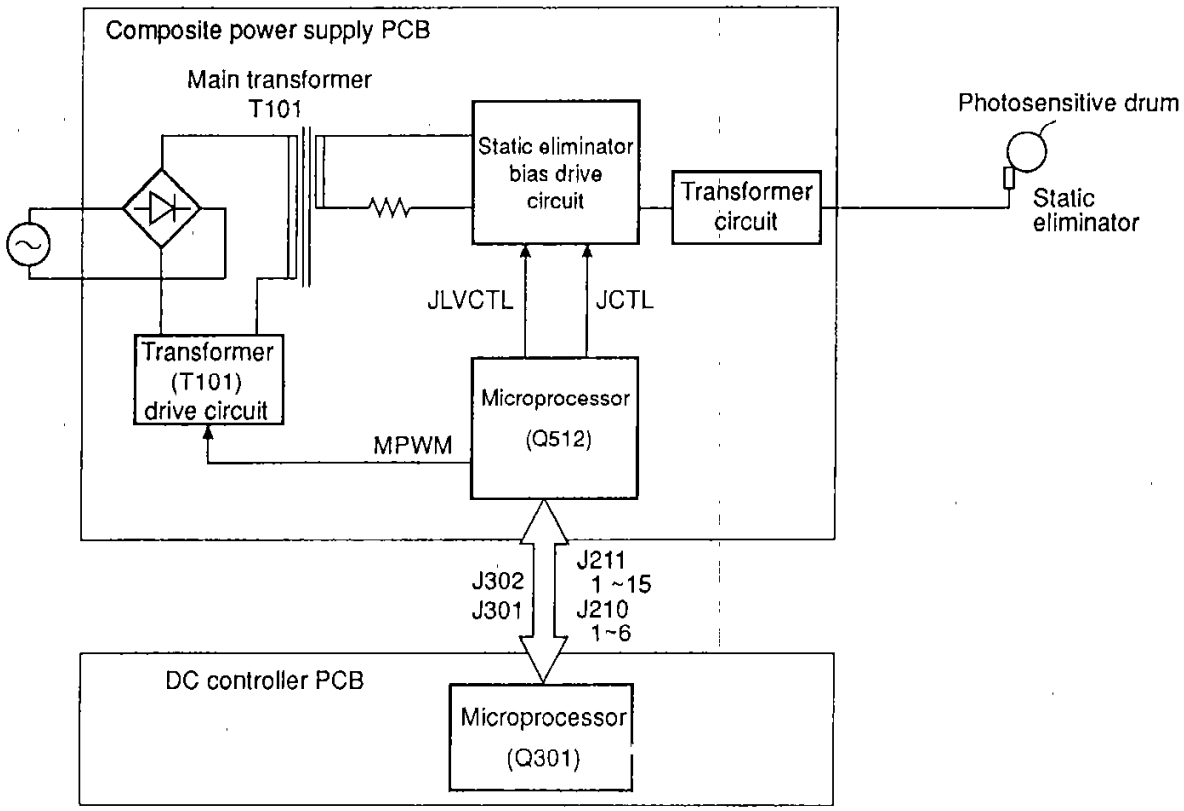

Figure 3-313

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2. Switching the Static Eliminator Bias Voltage Level

The microprocessor (Q512) on the composite power supply PCB generates the JCTL signal (analog signal) under the control of the DC controller PCB. In response, the secondary side of the main transformer (T101) turns on to generate a bias for the static eliminator with the help of the main transformer (T101).

The output of voltages (2.5 kV, 4.0 kV) is switched by the JLVCTL signal.

When the JCTL signal turns on, the drive circuit turns on to generate the static eliminator bias.

3. Ensuring Proper Separation of Thin Paper

Under some environmental conditions, thin paper can fail to separate at times.

To ensure proper separation, the voltage applied to the static eliminator may be permanently set to 4.0 kV.

To do this, use service mode No. 506 (separation static eliminator output voltage; see p. 3-81).

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G. Controlling the Development Bias

1. Outline

Figure 3-314 shows the circuit used to control the development bias; the circuit has the following functions:

- turns on and off the AC component of the development bias
- turns on and off the DC component of the development bias
- controls the voltage level of the DC component of the development bias
- controls the DC component of the development bias to a constant level

2. Turning On and Off the DC Component of the Developing Bias and Controlling the Voltage to a Constant Level

The microprocessor (Q512) on the composite power supply PCB generates the BPWM signal (pulse signal) under the control of the microprocessor master (Q301) on the DC controller PCB. In response, the secondary side of the main transformer (T101) turns on to apply the DC component of the development bias.

In addition, while the DC component of the development bias is being applied, the application voltage is taken in from the development DC bias voltage detection circuit in the form of the BIASS signal (analog signal) to exert control so that the output voltage is maintained at a constant level.

The main transformer (T101) is driven by the drive signal (MPWM) from the microprocessor (Q512). In addition to the foregoing functions, the main transformer (T101) is also used as the high-voltage transformer for the DC power supply and other loads.

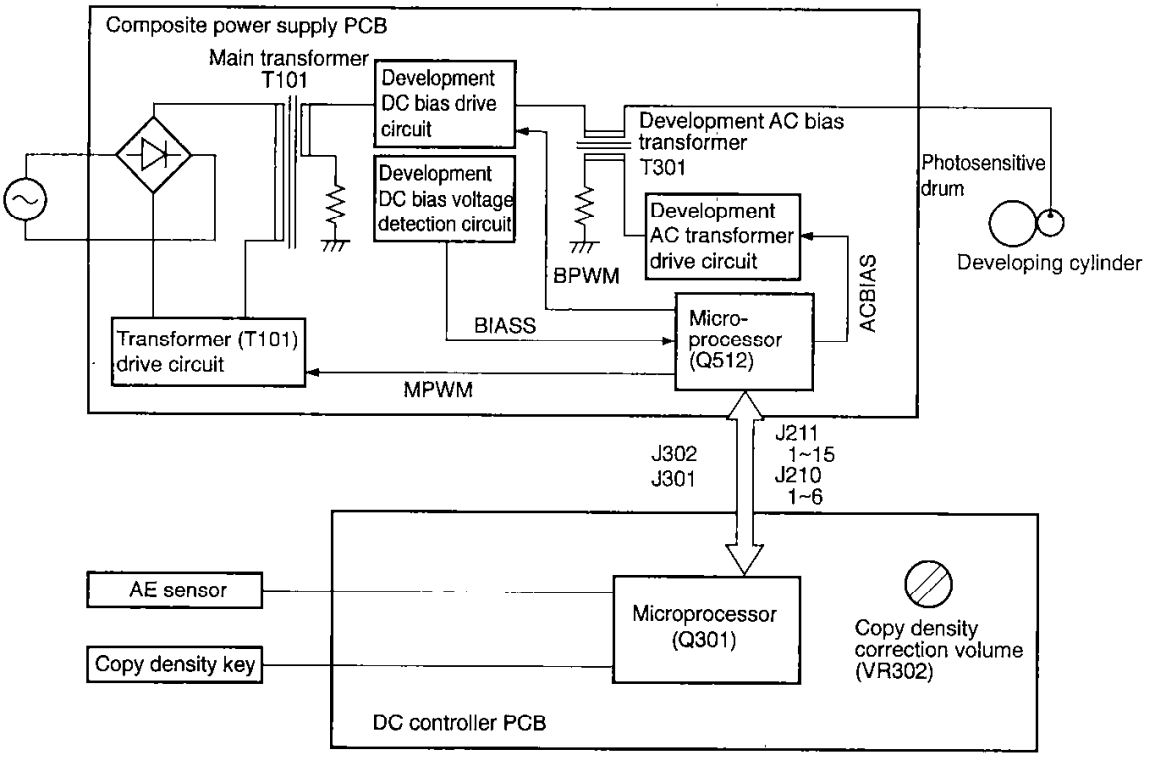

Figure 3-314

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3. Turning On and Off the AC Component of the Development Bias

The microprocessor (Q512) on the composite power supply PCB generates the ACBIAS signal (pulse signal) under the control of the microprocessor master (Q301) on the DC controller PCB. In response to the signal, the development bias AC component generating transformer (T301) turns on to add the AC component of the development bias to the DC component for application.

- application frequency 2400 Hz (approx.)
- application voltage 1300 Vp-p (approx.)

4. Controlling the Voltage Level of the DC Component of the Development Bias

The copier modifies the voltage level of the DC component of the development bias based on the following factors:

- setting of the Copy Density key
- output of the AE sensor
- position of the Copy Density Correction switch (SW301)

The copier controls so that the voltage of the DC component of the development bias varies between –80 and –560 V (in actual terms) by varying the output of the BPWM signal.

To prevent increases in the *light* potential (V_L) caused by deterioration of the photosensitive drum, the copier is equipped with a copy density correction volume. You may operate the volume (VR302) on the DC controller PCB to adjust the potential of the DC bias for any increase in V_L, thereby freeing the copies of fogging.

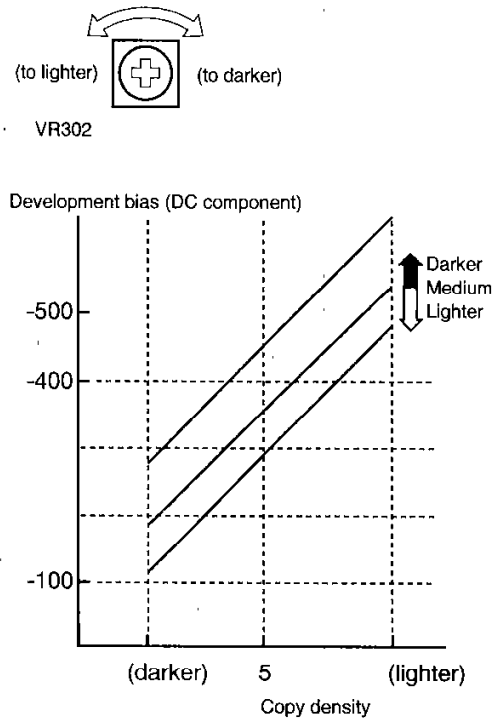


Figure 3-315

H. Automatic Control of Copy Density

1. Outline

The copier has an automatic density adjustment mechanism (AE), which automatically controls the DC component of the development bias according to the density of originals. As long as the original is more or less uniform in density, the AE mechanism varies the DC component of the development bias accordingly to ensure fogging-free copies.

The DC component controlled in AE mode is indicated in the copy density display of the control panel.

2. Control Method

During initial rotation (INTR), the scanning lamp (FL1) is turned on at a specific intensity and the scanner is moved forward about 65 mm to expose the original.

With the scanner in this position, the reflected light over the area shown in Figure 3-317 is measured by the AE sensor (photodiode), and the measurements are sent to the DC controller PCB.

In response, the DC controller PCB computes the optimum value of the development DC bias for copying operation, and generates the result to the microprocessor on the composite power supply. Figure 3-316 shows the changes in the DC component of the development bias caused by the changes in the density of an original.

The graph is based on the amount of exposure that brings optimum density without fogging when copies are made of a newspaper or a Test Sheet.

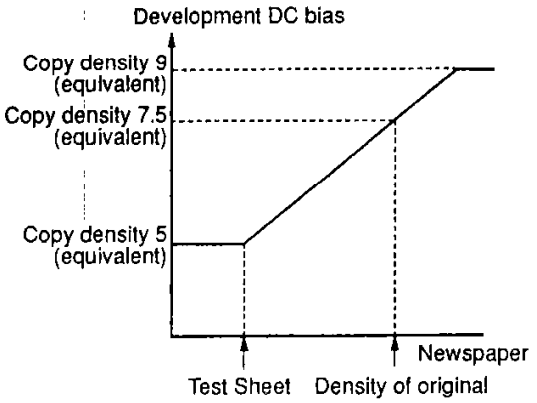
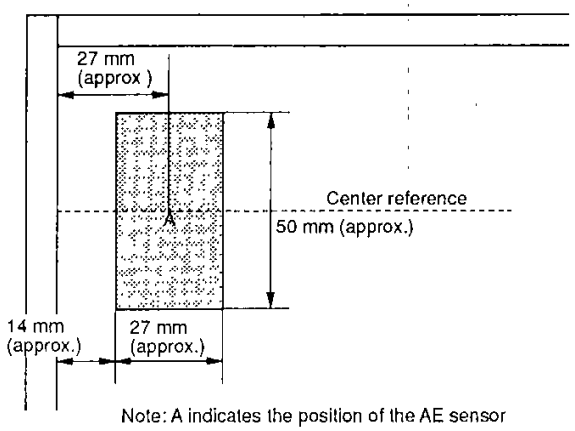


Figure 3-316



Note: A indicates the position of the AE sensor

Figure 3-317 (Area Read by the AE Sensor)

Reference:
When copies are made in AE using an ADF-E1 (option), the density is checked for each original.

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3. AE Adjustment

The copier's AE adjustment is executed in service mode and consists of the following three types:

- lamp intensity automatic adjustment (No. 301) during AE scans
- copy density (development bias) standard adjustment (No. 302) during AE mode
- copy density (development bias) slope adjustment (No. 303) during AE mode

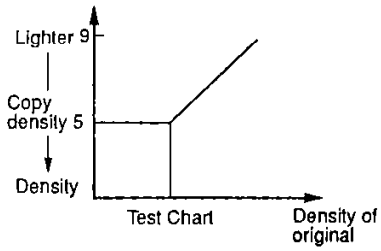
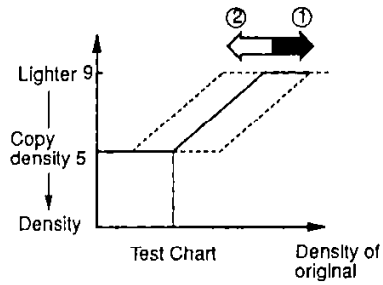
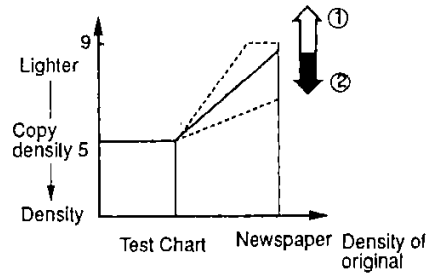
Item	Description	Adjustments	Remarks
No. 301	Lamp intensity automatic adjustment during AE scans		The density is adjusted automatically so that the copy density will be 5 when making copies of the Test Chart.
No. 302	Copy density (development bias) standard adjustment during AE mode		①If the setting is decreased in service mode, →AE copies will be darker. ②If the setting is increased in service mode, →AE copies will be lighter. default: 0 settings: –26 to +26
No. 303	Copy density (development bias) slope adjustment during AE mode		①If the setting is increased in service mode, →copies of a newspaper will be lighter. ②If the setting is decreased in service mode, →copies of a newspaper will be darker. default: 0 settings: –26 to +26

Table 3-303

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I. Developing/Cleaning Assembly

1. Outline

The copier's photosensitive drum, developing cylinder, No. 1 stirring rod, and No. 2 stirring blade are rotated by the drive of the main motor (M1).

The level of the toner inside the developing assembly is monitored by the toner sensor; when it drops below a specific level, the Add Toner indicator flashes on the display of the control panel.

The No. 1 stirring rod serves to supply toner to the developing cylinder and stir the toner flow layer inside the developing chamber.

The No. 2 stirring blade is used to stir the toner inside the toner container and, at the same time, to supply toner to the developing chamber.

The waste toner collected by the cleaning blade is forwarded by the waste toner feed blade for collection inside the waste toner assembly.

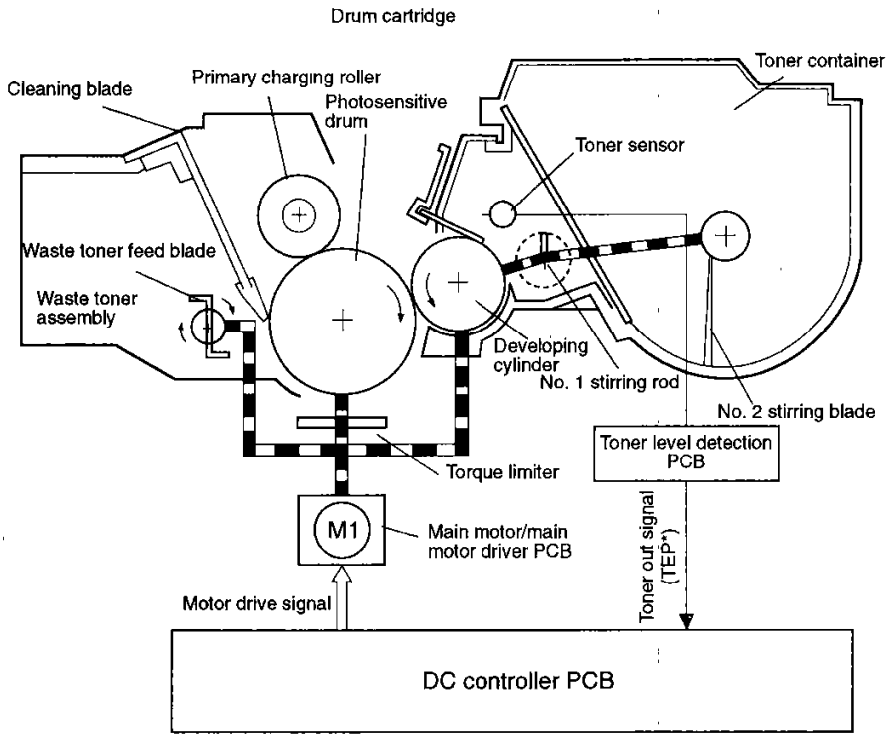

Figure 3-318

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2. Controlling the Toner Level Detection

The level of toner inside the cartridge is monitored by the antenna sensor circuit.

The toner level sensor is found inside the cartridge, and an AC bias is applied to the developing cylinder.

The developing cylinder and the toner level sensor are connected by means of static electricity; the volumes of charges between the two vary according to the amount of toner inside the cartridge; as a result, an AC bias that represents the level of the toner is checked by the toner level sensor, and the data is sent to the antenna sensor circuit.

The antenna sensor circuit receives a reference signal from the composite power supply circuit; the reference signal is an AC bias with a specific AC bias that has gone through attenuation.

In the antenna circuit, the signal coming from the toner level sensor and the reference signal are compared to find out the level of toner.

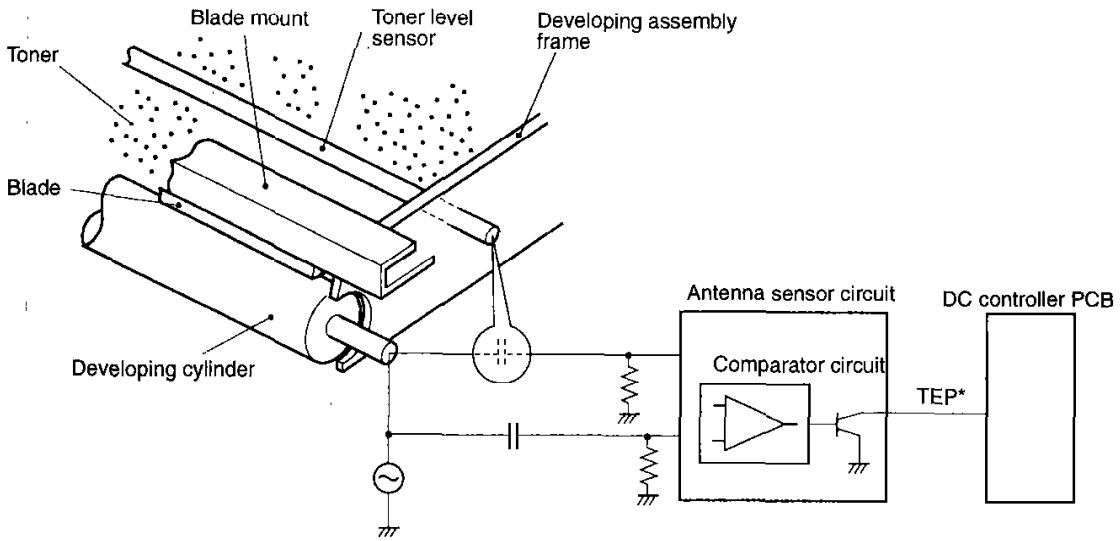

Figure 3-319

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① When the Level of Toner Is Adequate

The presence of toner around the toner level sensor causes the AC bias generated by the sensor to be larger than the reference signal.

The condition causes the output from the comparator circuit to go '1' and the toner out signal (TEP*) to go '0'.

② When the Level of toner Is Inadequate

The toner around the toner level sensor decreases in amount, causing the AC bias generated by the sensor to lower.

Since the reference signal, on the other hand, remains unchanged, the output voltage remains high.

The difference in the potential causes the output of the comparator circuit to go '0', causing the toner out signal (TEP*) to go '1'.

The condition causes the microprocessor (Q301) in the DC controller cirucit to make checks only during copying operating (AC bias ON); if it detects the toner out signal=0, each lasting 0.25 sec or more, for a total time equivalent of three copies, the Cartridge indicator is flashed on the display of the control panel.

③ Torque Limiter

If an excessive load is imposed on the photosensitive drum because of excessive amounts of waste toner or some other reason while the drum is rotating, the torque limiter cuts off the drive from the main motor to stop the rotating of the drum.

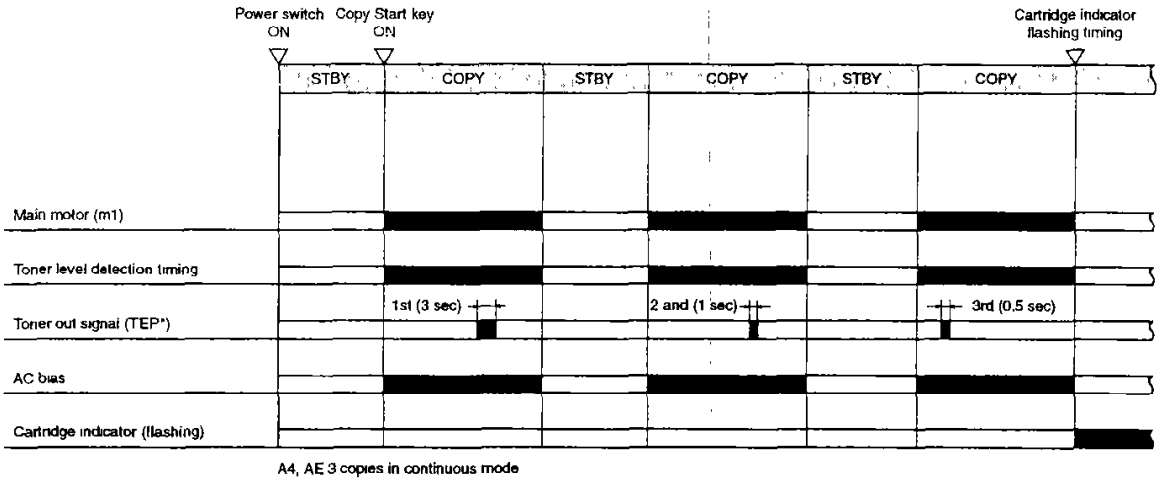

Figure 3-320

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J. Controlling Blank Exposure

1. Outline

The copier uses the reflecting plate to direct the light of the pre-exposure lamp to the photosensitive drum by way of executing blank exposure, thereby blanking (whiting) out the non-image areas and areas between copies.

The area of blank exposure is controlled by the two slide shutters and one open/close shutter.

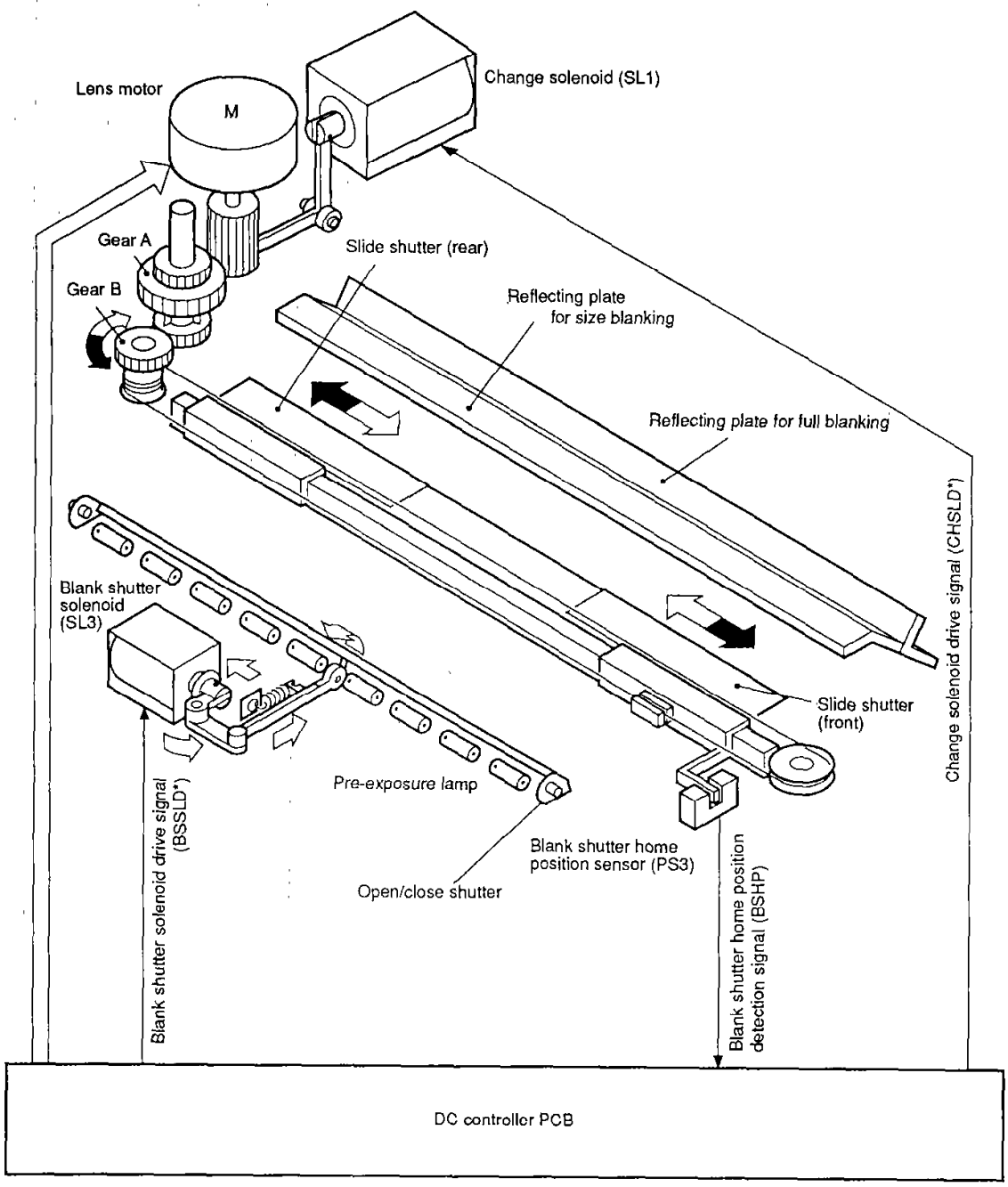

Figure 3-321

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2. Blanking (Whiting) of Non-Image Areas for Reduction

In Reduce mode, the change solenoid (SL1) turns on, and the lens moves according to the selected reproduction ratio. When the change solenoid (SL1) turns off, the drive of the lens motor is transmitted to gears A and B, thereby moving the slide shutter (rear, front) for the appropriate distance to open the exposure window. In this condition, the light from the pre-exposure lamp is directed to the photosensitive drum by way of the reflecting plate for size blanking.

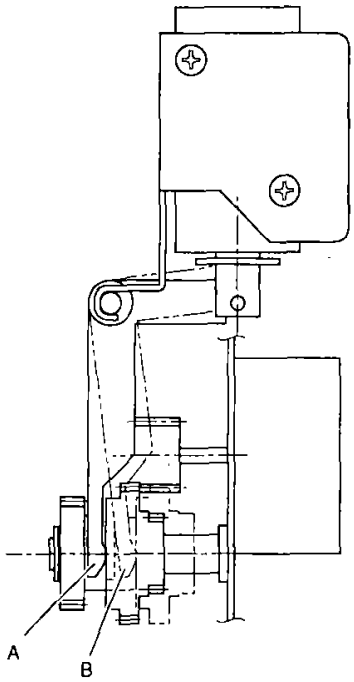

Figure 3-322

3. Blanking (Whiting) Out the Leading/ Trailing Edges and between Copies

The blank shutter solenoid drive signal (BSSSLD) turns on or off under the control of the microprocessor (Q301) on the DC controller. The leading/trailing edge and the area between copies are blacked (whited) out by opening the open/close shutter in this way.

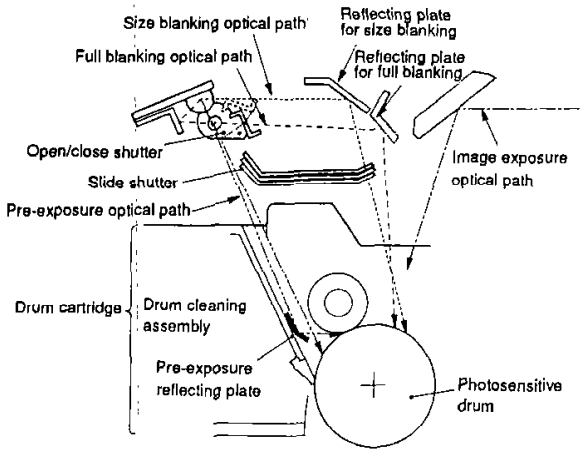

Figure 3-323

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K. Controlling the Primary Corona Roller Cleaning Mechanism

1. Outline

The copier's primary charging roller is equipped with an automatic cleaning mechanism.

The automatic cleaning mechanism cleans the primary charging roller during initial rotation(INTR) after having made 250 or more copies, i.e., after executing transfer roller release control five times.

2. Primary Charging Roller Cleaning Operation

The primary charging roller cleaning solenoid (SL4) on signal (PCLSLD) is generated under the control of the microprocessor (Q301) on the DC controller PCB. In response to the signal, the cleaning pad is butted against the roller for 2 sec, during which time the cleaning roller makes about 4 rotations.

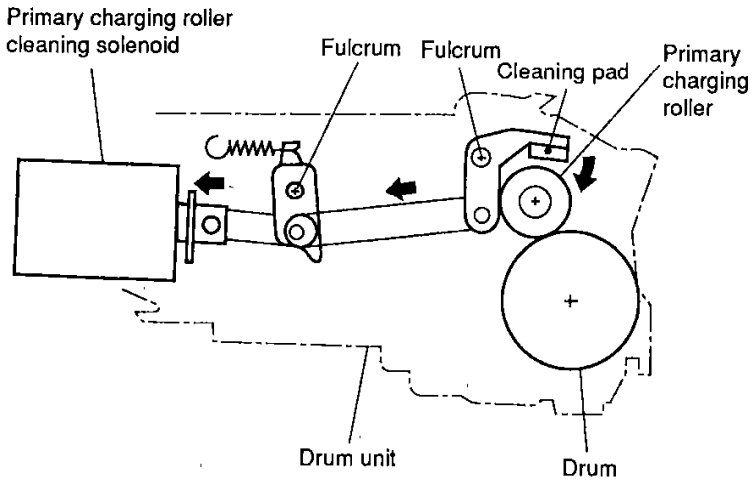

Figure 3-324

L. Releasing the Transfer Roller

1. Outline

The copier's transfer roller is equipped with a releasing mechanism.

The releasing mechanism releases the transfer roller to prevent adhesion of toner to the roller under the following condition:

- during post rotation (LSTR) after as many as 50 copies or more have been made (cumulative)

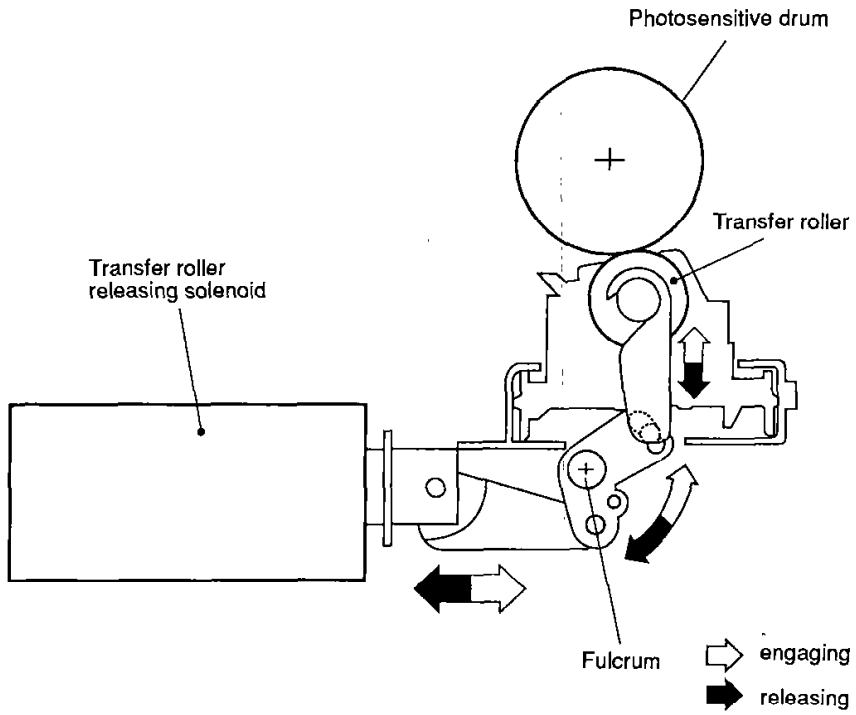

Figure 3-325

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IV. PICK-UP/FEEDING SYSTEM

A. Pick-Up Operation (copier)

1. Outline

When the pick-up clutch (CL2 or CL3) turns on while the main motor (M1) is rotating, the pick-up roller rotates to move paper as far as the registration roller.

The copy paper is controlled so that its leading edge and the leading edge of the image on the photosensitive drum match; then, it is moved through the transfer assembly, feeding assembly, fixing assembly, and delivery assembly to reach the copy tray.

As many as three photointerrupters (PS6, PS7, PS8) are provided along the paper path, turning on the Jam indicator on the control panel when jams are identified in terms of whether paper has reached or has moved past the respective sensors within a specific period of time.

The presence/absence of paper inside the cassette or the multifeeder is monitored by separate photointerpreters (PS4, PS5); when the absence of paper is identified, the Paper indicator is flashed on the control panel.

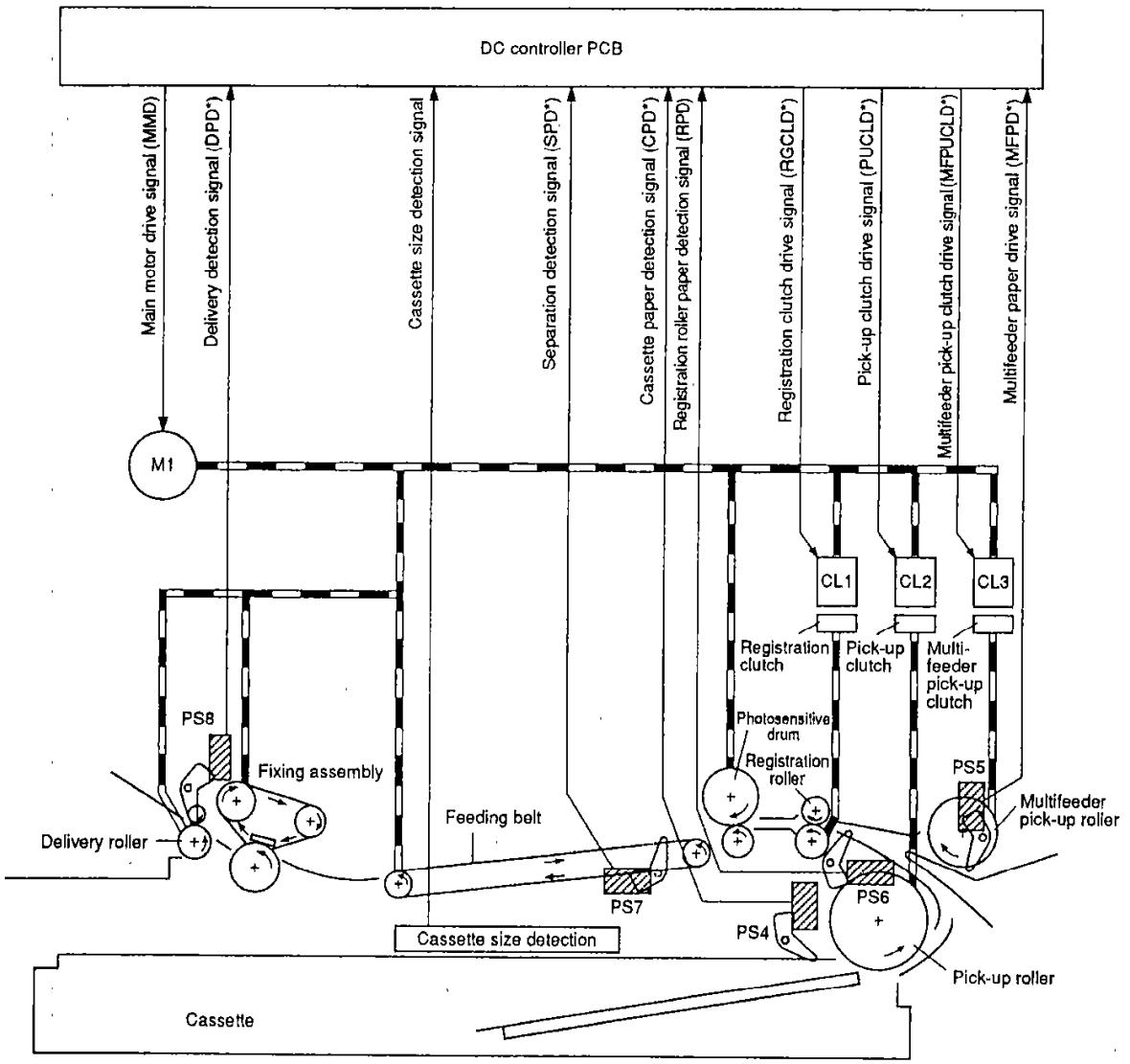

Figure 3-401

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2. Sequence of Operations (pick-up/feeding assembly; A4, 2 copies)

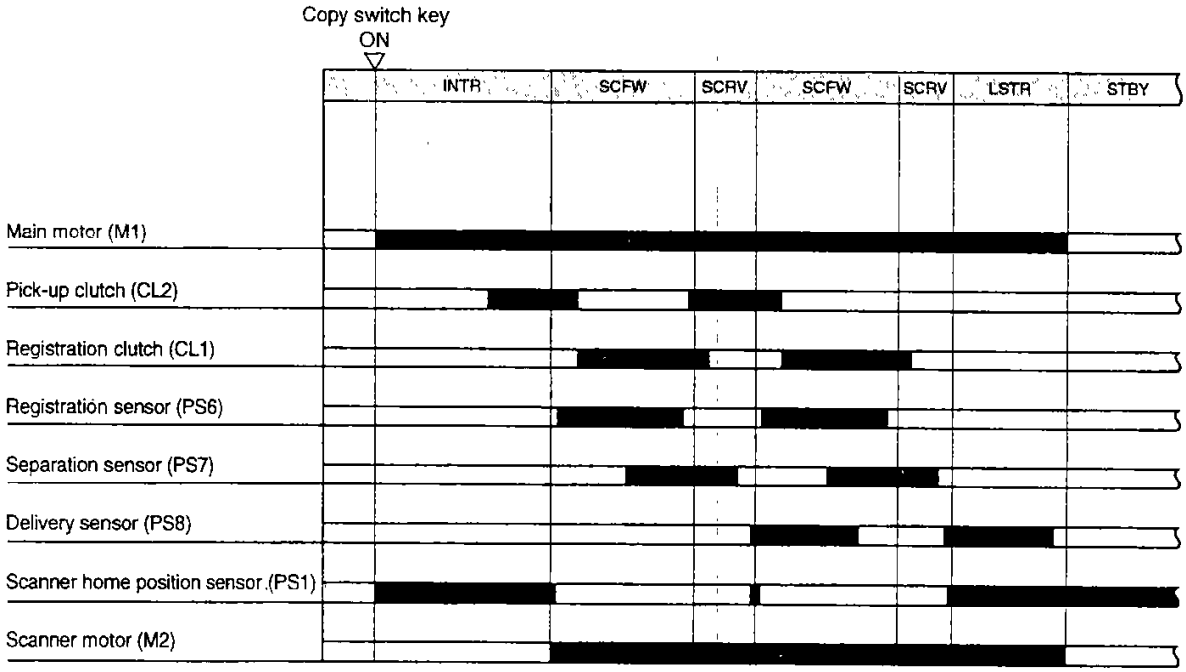

Figure 3-402

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B. Pick-Up from the 2-Cassette Feeding Unit

1. Pick-Up Operation

When the pick-up clutch (CL1cu, CL2cu) turns on while the cassette unit motor (M1cu), the pick-up roller starts to rotate to pick up copy paper; the paper is then moved to the registration roller by the vertical path roller. (The sequence that follows is the same as when paper is picked up from the cassette in the copier.)

For pick-up operation from the cassette feeding unit, pick-up sensors (PS1cu, PS3cu) are used to check the arrival of paper, thereby deciding when to turn off the pick-up roller according to the size of paper.

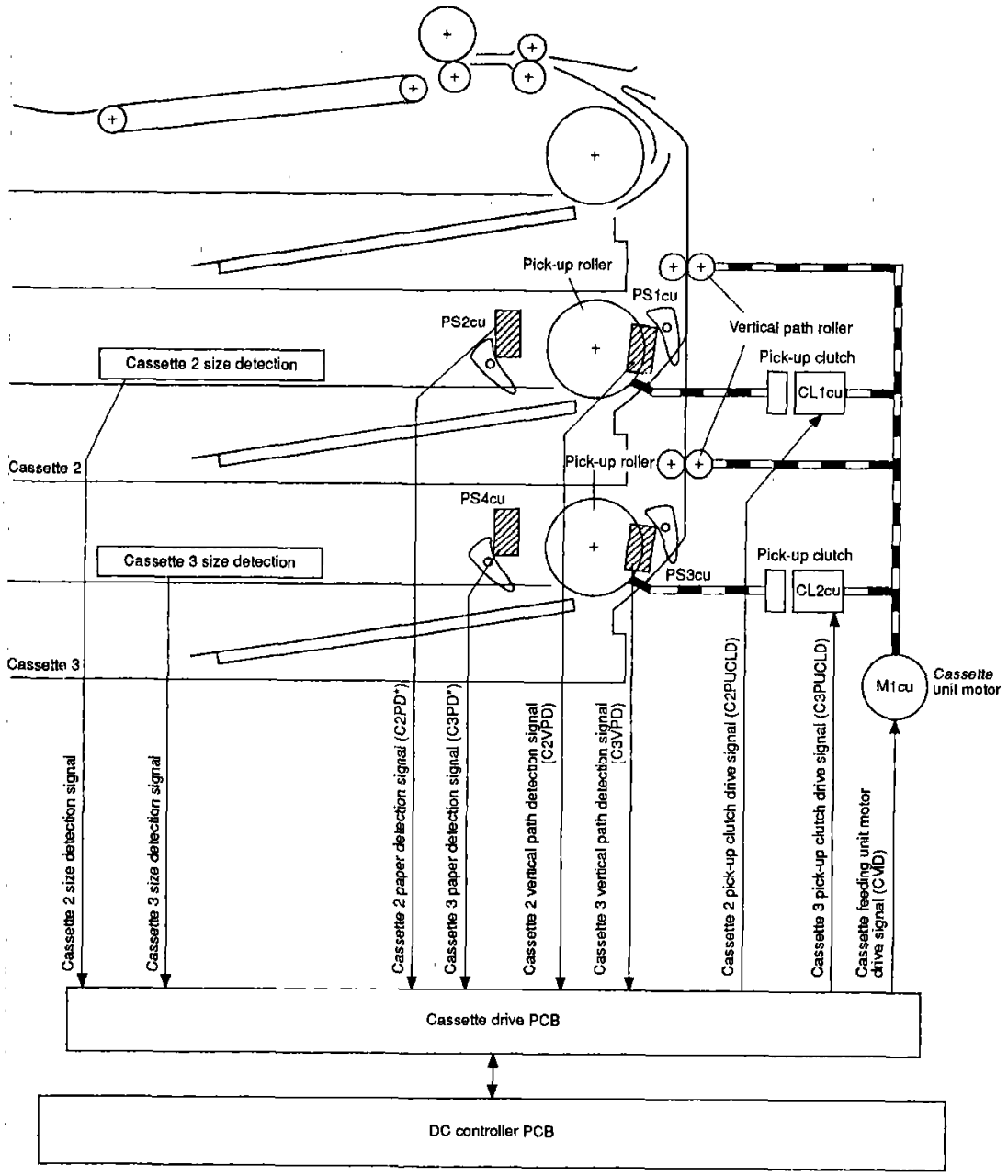

Figure 3-403

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2. Sequence of Operations (cassette 2; A4, 2 copies)

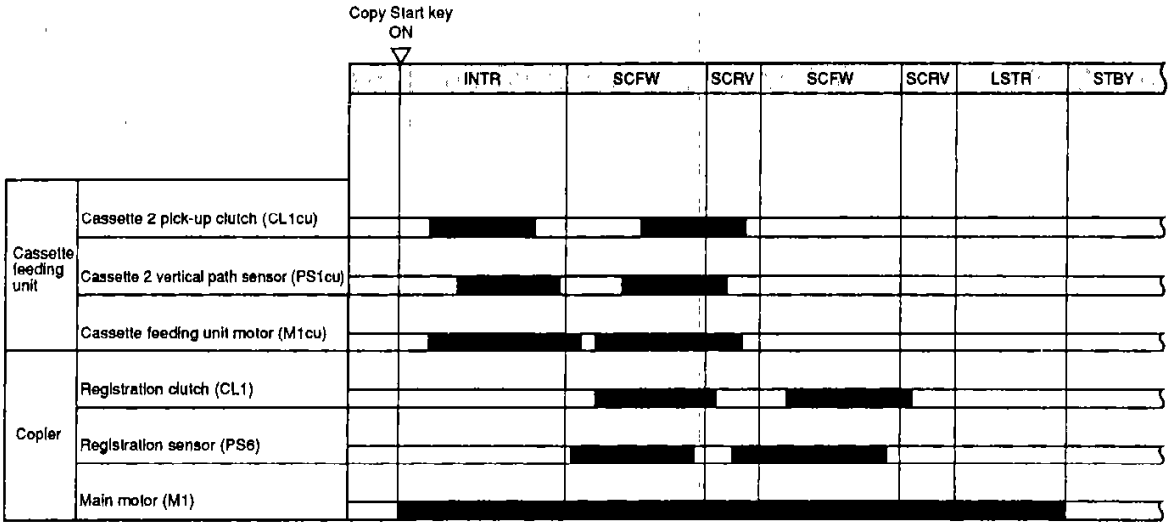

Figure 3-404

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C. Multifeeder

1. Outline

The multifeeder is designed to pick up paper loaded on its tray and is capable of continuous pick-up operation.

Paper on the tray is detected by the multifeeder sensor (PS5).

Paper loaded on the tray is butted against the pick-up roller by the paper guide plate; the drive from the main motor (M1) is transmitted to the pick-up roller through a clutch to rotate the pick-up roller.

By the work of the pick-up roller and the separation pad, a single sheet of copy paper is forwarded to the registration roller.

The series of operations is executed for each pick-up operation.

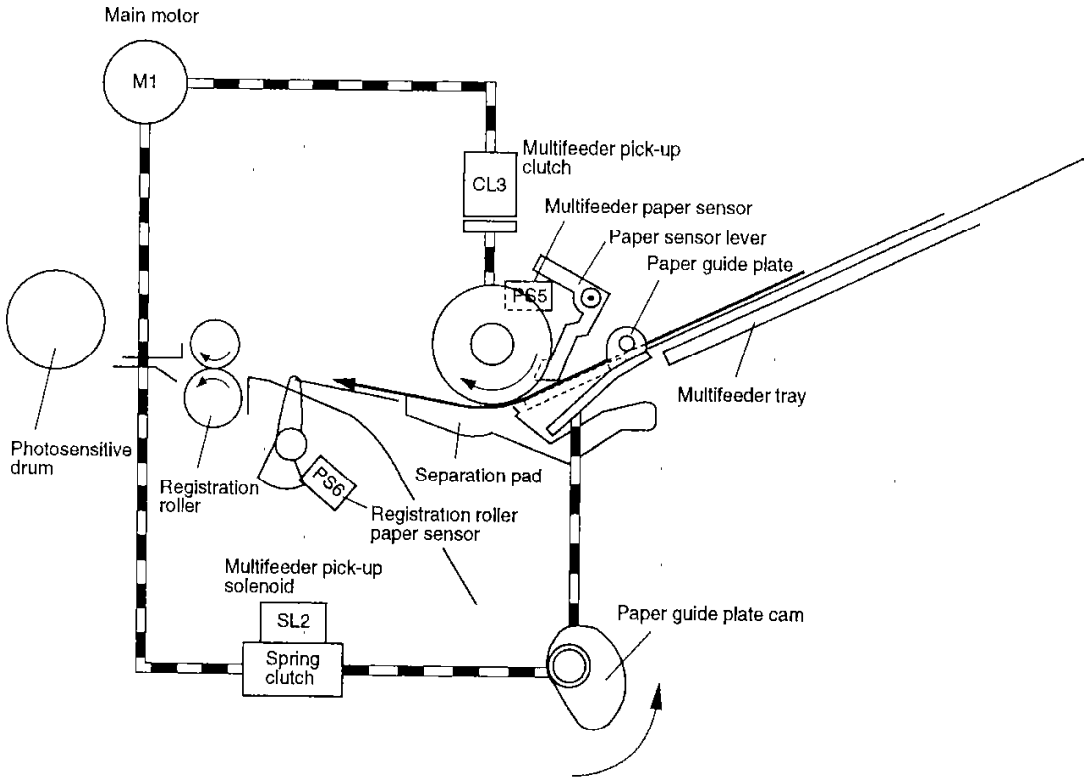

Figure 3-405

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2. Identifying the Size of Paper on the Multifeeder

The width of copy paper is identified by a variable resistor (VR1) which operates in response to the location of the slide guide, which is adjusted by the user to suit the size of paper.

The identified width of copy paper is used for blank exposure control.

The length of paper when the multifeeder is used is identified by the period of time during which the registration sensor (PS6) remains on.

The data collected in such a way is used to control the length of blank exposure, activation of the registration roller, and high voltage.

Reference:
The maximum length of paper is 432 mm (LDG size); paper longer than this will lead to a jam.

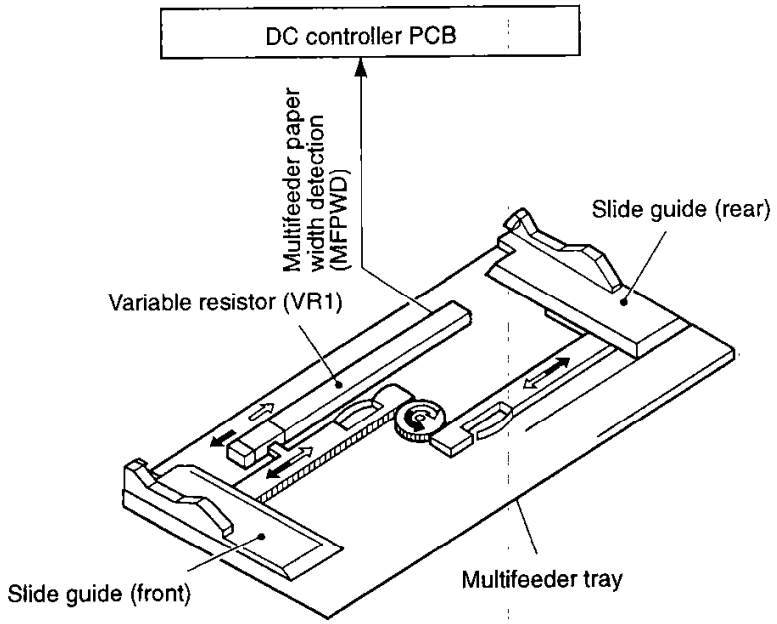

Figure 3-406

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3. Sequence of Operations (multifeeder; A4, 2 copies)

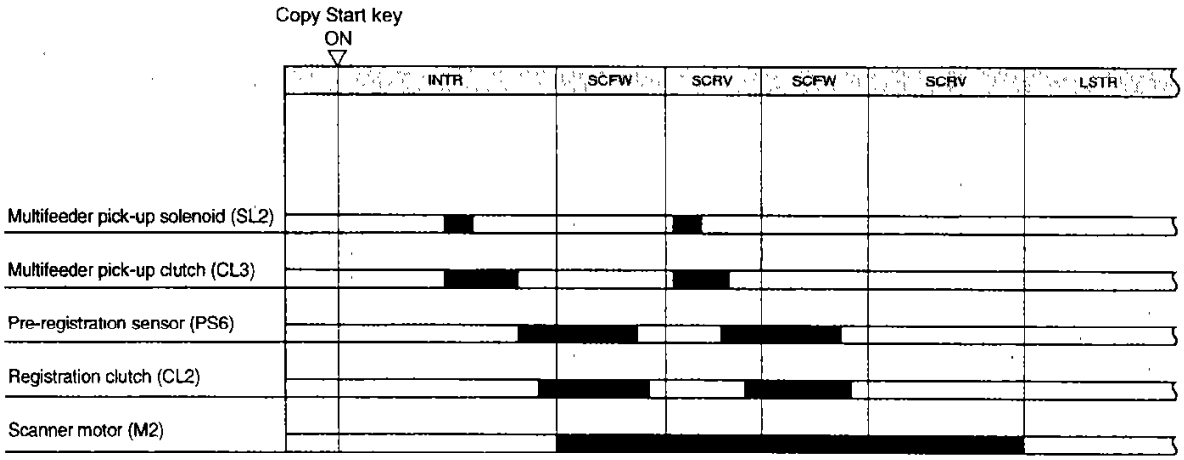

Figure 3-407

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D. Identifying the Cassette Size

When a cassette is set in the cassette holder, appropriate photointerrupters (Q651, Q652, Q653, Q654) turn on or off.

The microprocessor on the DC controller PCB identifies the presence/absence of a cassette based on the combinations of the photointerrupters which are either on or off (Table 3-401); accordingly, the microprocessor controls where the scanner must be reversed or when to execute blank exposure.

Arrangement / Cassette size	Q651 (left)	Q652	Q653	Q654 (right)
No cassette	0	0	0	0
B5R (182 × 257)	0	0	0	1
A4 (297 × 220)	0	0	1	0
A3 (297 × 420)	0	0	1	1
Mini (STMTR) 5.5" × 8.5" (148 × 216)	0	1	0	0
Legal 8.5" × 14" (356 × 216)	0	1	0	1
Letter 11" × 8.5" (279 × 216)	0	1	1	0
A4R (210 × 297)	0	1	1	1
Letter R 8.5" × 11" (216 × 279)	1	0	0	0
A5R (149 × 218)	1	0	0	1
A5 (218 × 149)	1	0	1	0
Mini-R (STMT) 8.5" × 5.5" (216 × 148)	1	0	1	1
B5 (257 × 182)	1	1	0	0
B4 (364 × 257)	1	1	0	1
Ledger 11" × 17" (182 × 257)	1	1	1	0
*U (182 ~ 283 × 198 ~ 354)	1	1	1	1

(unit: mm)

1: photointerrupter is blocking light.
0: photointerrupter is not blocking light.
*size may be stored; must be within the range specified in mm; for details, see the Service Handbook.

Table 3-401

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To change the cassette size, you must not only move the guide plate (horizontal, vertical) inside the cassette to suit the copy paper but also move the paper size lever located toward the front of the cassette (Figure 3-408) to the left or right so that the arrow points to the appropriate paper size.

Caution:
A discrepancy between the size set by the paper size lever and the size of copy paper will result in jams or soiling because of the wrong copying sequence.
Advise the user to be sure to match the size set by the paper size lever and the size of copy paper.

Reference:
Paper size configurations differ from area to area; however, you may still make sure of a specific copy control sequence for the size of paper that does not fall under the respective category—the size, nevertheless, will not be indicated on the display.
For instance, you may use LTR paper for a metric model. (The paper size lever, in this case, will be set to LTR.) This arrangement causes the copier to execute the copying sequence intended for LTR copies.

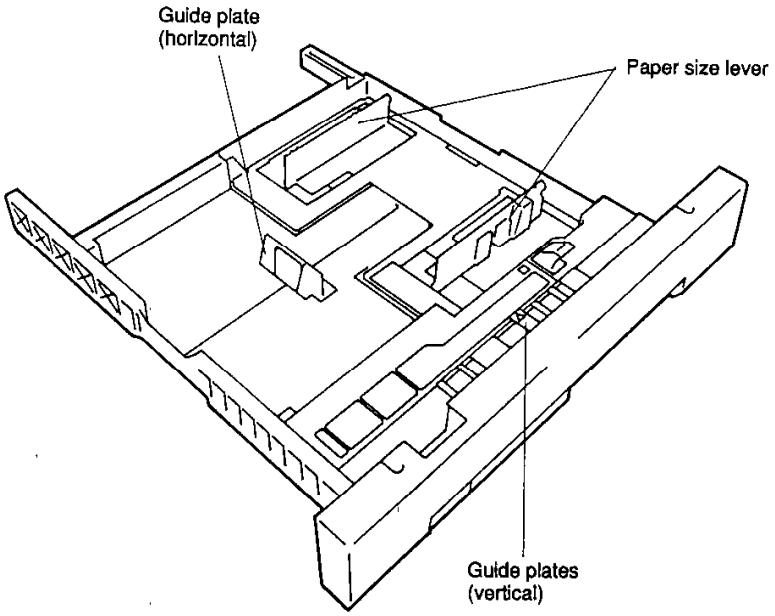

Figure 3-408

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E. Fixing/Delivery Assembly

1. Outline

The drive roller of the fixing assembly is driven by the main motor (M1).

When the drive roller rotates, the fixing film rotates and, in conjunction, the pressure roller rotates.

Part of the inside of the fixing film is heated by the fixing heater.

The temperature of the fixing heater is monitored by a thermistor (TH1), and the result is sent to the microprocessor in the DC controller circuit in the form of the fixing heater temperature detection signal (TH1).

Based on the result (TH1 signal), the microprocessor on the DC controller varies the fixing heater drive signal (HTRD) to control the temperature of the fixing heater.

Further, a thermistor (TH2) is also provided on the end (rear) of the fixing heater to monitor overheating.

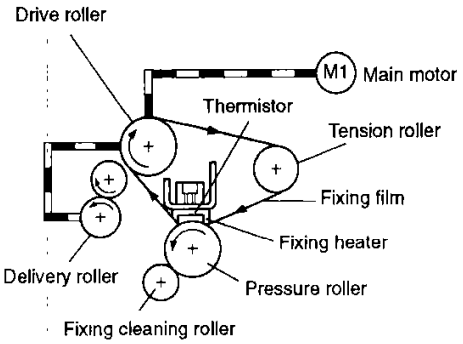

Figure 3-409

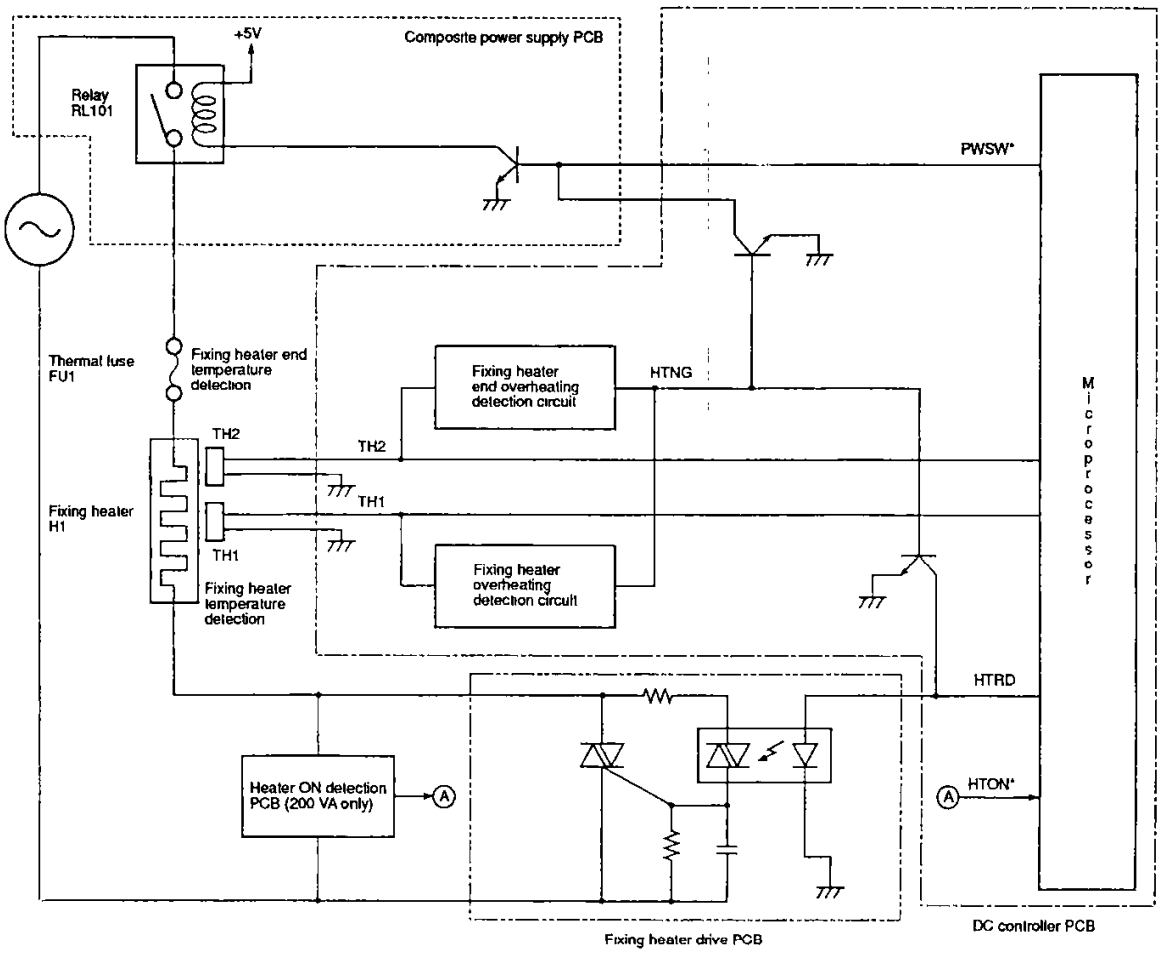

Figure 3-410

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2. Controlling the Fixing Heater Temperature

The fixing heater remains off while the copier is in standby state. To prevent fixing faults caused by low temperature, its temperature is controlled in any of the following three modes depending on the temperature at the time copying is started (as measured by the main thermistor TH1) and the number of copies to be made in continuous mode:

a. If the temperature at the time copying is started is 140°C or more, it is controlled so that it remains 180°C at all times.
- 1st to 100th copy → 180°C

b. If the temperature at the time copying is started is 120°C or more and less than 140°C, it is controlled so that it remains between 200° and 180°C depending on the number of copies to be made.
- 1st copy → 200°C
- 2nd to 9th copy → 195°C
- 10th to 20th copy → 190°C
- 21st to 25th copy → 185°C
- 26th to 100th copy → 180°C

c. If the temperature at the time copying is started is less than 120°C or less, the temperature is controlled to 225°–180°C, 215°–180°C, or 200°–180°C selected by service mode. (See the Service Handbook.)

■Control 1
- 1st to 4th copy → 225°C
- 5th copy → 220°C
- 6th copy → 215°C
- 7th copy → 210°C
- 8th copy → 205°C
- 9th to 20th copy → 200°C
- 21st to 25th copy → 195°C
- 26th to 40th copy → 190°C
- 41st to 45th copy → 185°C
- 46th to 100th copy → 180°C

■Control 2 (default)
- 1st to 4th copy → 215°C
- 5th copy → 210°C
- 6th copy → 205°C
- 7th to 20th copy → 200°C
- 21st to 25th copy → 195°C
- 26th to 40th copy → 190°C
- 41st to 45th copy → 185°C
- 46th to 100th copy → 180°C

■Control 3
- 1st to 20th copy → 200°C
- 21st to 25th copy → 195°C
- 26th to 40th copy → 190°C
- 41st to 45th copy → 185°C
- 46th to 100th copy → 180°C

Reference:
Normally, control 2 is used. Use control 1 to increase the control temperature if a fixing fault occurs; or use control 3 to lower the control temperature if offset occurs. (See the Service Handbook.)

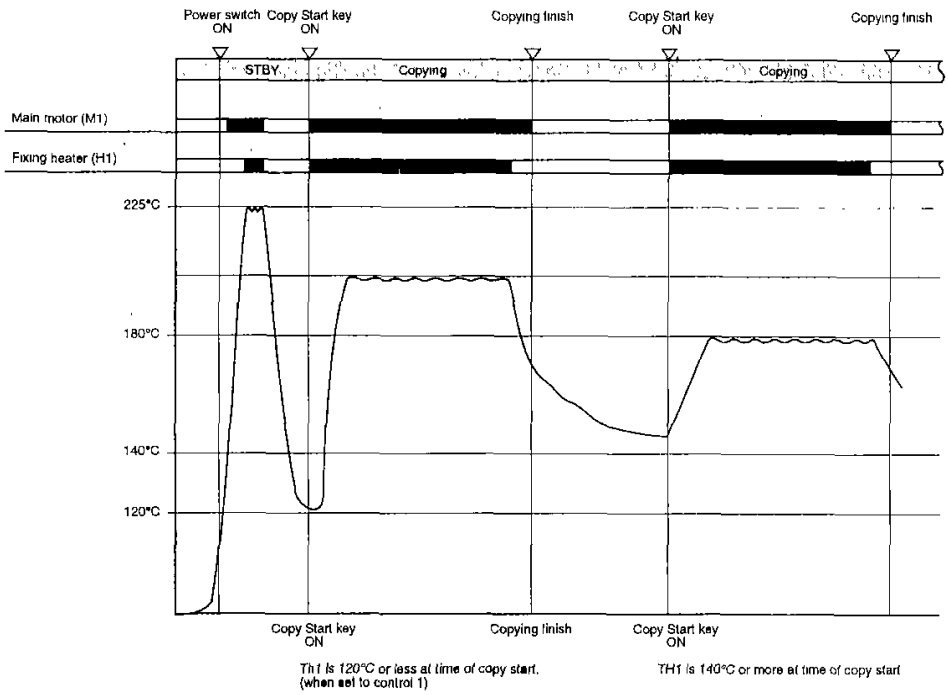

Figure 3-411

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3. Controlling the Supply Power for the Fixing Heater

The temperature of the fixing heater is controlled by controlling the power supplied to the fixing heater.

The resistance of the plane-shaped heater used as the fixing heater may show some variation depending on which production lot it comes from.

For this reason, whenever you have replaced the copier's heater, you must store the resistance value in service mode (No. 304; see p. 3-77); this way, the microprocessor on the DC controller PCB can exert proper control over power.

Caution:
The resistance of the fixing heater is stored in service mode at the time the copier is shipped out of the factory; do not change it unless you have replaced the fixing heater.

The power of the fixing heater is controlled by a phase power control method.

The microprocessor controls the output timing of the fixing heater drive signal (HTRD) so that power that suits the target temperature of the fixing heater may be supplied to the heater (potential control of the supply power).

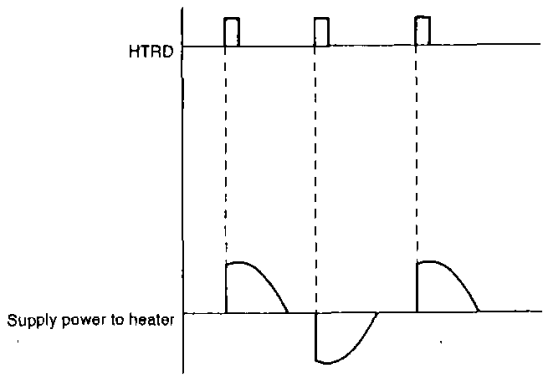

Figure 3-412

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4. Detecting Overheating at the End of the Fixing Heater

A sub thermistor (TH2) is provided at the end (rear) of the copier's fixing heater to monitor overheating.

This consideration to prevent damage to the fixing film caused by overheating of the area where paper (smaller than B4) does not come into contact.

When TH2 registers 250°C or more, the distance between copies is increased to facilitate discharge of heat by the fixing heater, thereby preventing overheating.

The copier continues to make copies maintaining such a distance even after TH2 registers a value lower than 250°C.

If the temperature further increases after the distance has been increased and if the value reaches 260°C or more, the ongoing copying operation will be stopped and the power will be cut off; at the times E001 information is stored. (See p. 3-91.)

5. Protection Mechanism

The copier is equipped with the following protective functions to prevent malfunction of the fixing heater:

a. Thermistor (TH1, TH2)

1. The microprocessor on the DC controller monitors the voltage of the thermistor (TH1, TH2); if it detects a high or low temperature error, it stops the power to the heater and cuts off all the power. At the time, E000 thorugh E003 information is stored. (See p. 3-91.)
2. If the overheating detection circuit identifies that TH1 has registered 260°C or TH2 has registered 270°C for 0.3 sec or more, the heater error detection signal (HTNG) turns off the relay (RL101) to stop power to the fixing heater and cut off all the power. (See p. 3-91.)

Caution:
Be sure to disconnect the connector (J4) of the fixing heater and press the service switch (SW301) on the DC controller when turning on the power.

b. Thermal Fuse (FU1)

If the temperature around the thermal fuse remains 226°C or more for a specific period of time, the fuse melts to cut off the power to the fixing heater.

c. Heater ON Detection Circuit (200V model only)

The period of time during which the fixing heater drive signal (HTRD) remains off is detected; if an error is found, the power is cut off and E004 information is stored at the time.

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6. Correcting Displacement of the Fixing Film

a. Outline

The fixing film at times becomes displaced toward the front or rear as it keeps turning. To correct such displacement, the copier is equipped with a correction mechanism.

The control is executed by the fixing film sensor (PS9), which detects the position of the film, and the fixing film motor (M4), which physically corrects displacement.

Reference:
If you turn on the power by inserting the door switch actuator into the door switch with the top body of the copier open, E007 will be detected, since the condition prevents the fixing film from turning.

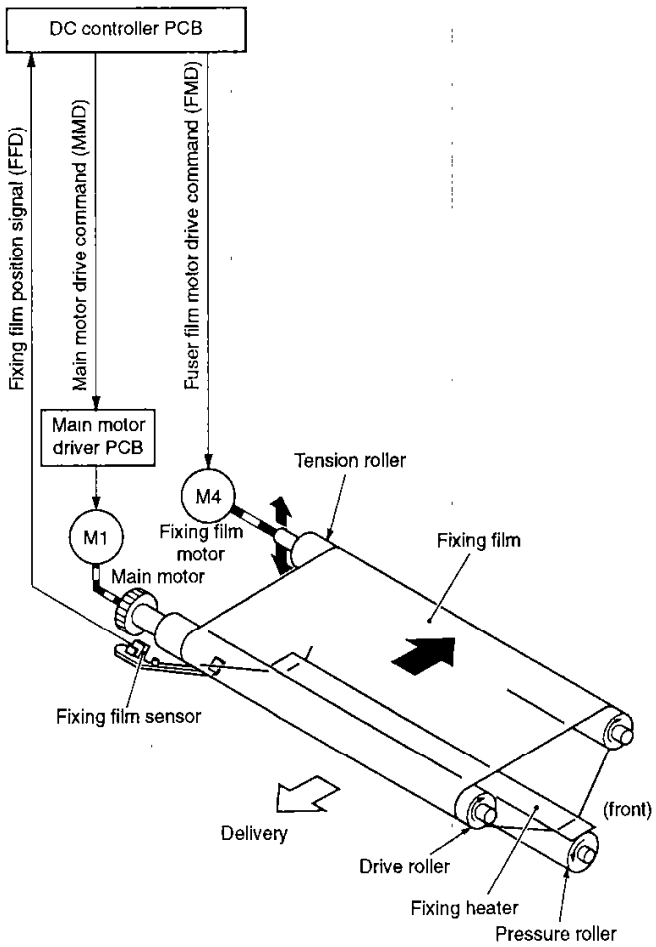

Figure 3-413

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The fixing film sensor (PS9) is used to detect the position of the fixing film and found at the end of the film.

The rear (sensor side) of the fixing film is provided with a cut as shown in Figure 3-414 so that the fixing film sensor continuously goes on and off.

Normally, the on and off periods of the sensor are identical as long as the fixing film remains centered.

If the film starts to become displaced toward the rear, however, the on period becomes longer; the off period becomes longer if the film starts to be displaced toward the front. (See Figure 3-415)

The DC controller monitors the on and off periods of the sensor and computes the difference to correct the position of the fixing film.

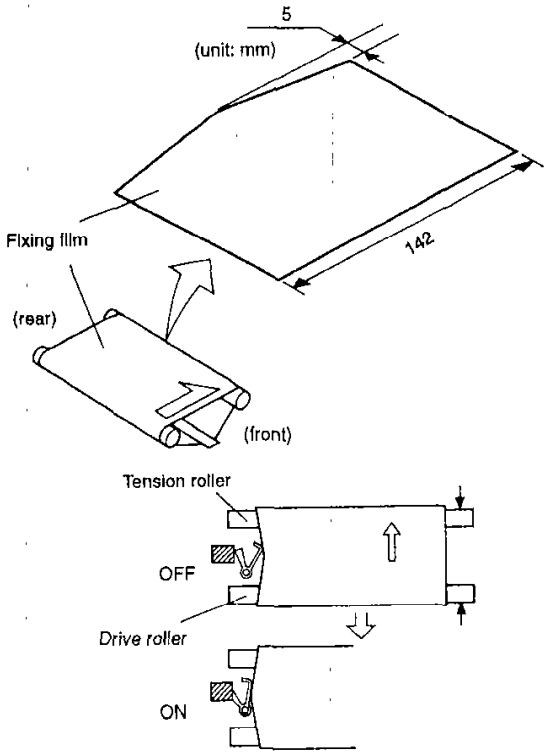

Figure 3-414

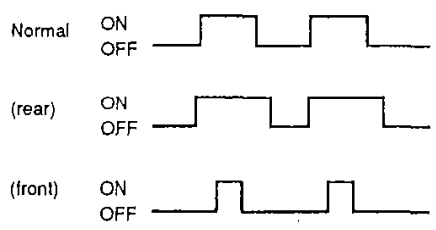

Figure 3-415

Displacement of the fixing film is physically corrected by the fixing film motor (M4).

When it identifies displacement of the fixing film, the DC controller rotates the fixing film motor to move the rear of the tension roller up and down, thereby moving the fixing film to the center to correct the displacement.

When the fixing film becomes displaced toward the rear, the tension roller is moved down to move the fixing film toward the front.

When the fixing film becomes displaced toward the front, on the other hand, the tension roller is moved up to move the fixing film toward the rear.

The fixing film is positioned properly by repeating these operations as necessary. If the film has become displaced so much that the mechanism fails to make adequate correction, 'E007' is indicated on the display. (See p. 3-91.)

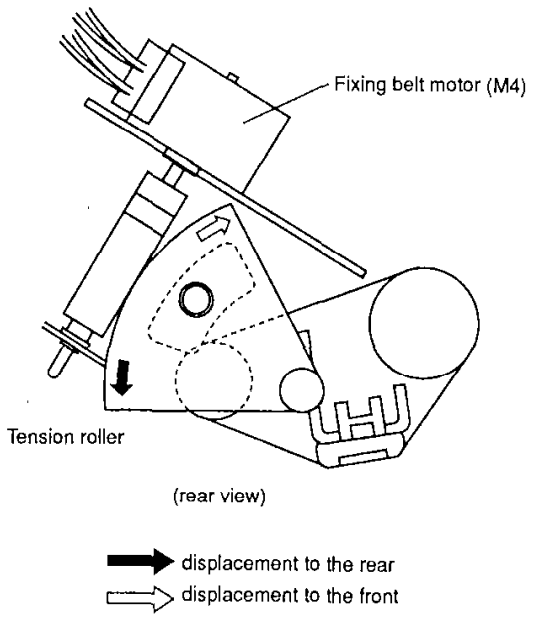

Figure 3-416

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b. Controlling the Fixing Film Motor

The fixing film motor is a stepping motor, and is rotated by the drive signal FMD and pulse signals FFA, FFA*, FFB, and FFB*.

When FMD is '1', the drive voltage FFCA and FFBCB are imposed; the motor starts to rotate when pulses are applied to each phase in specific sequence.

The motor is rotated in reverse by applying these pulses in reverse order.

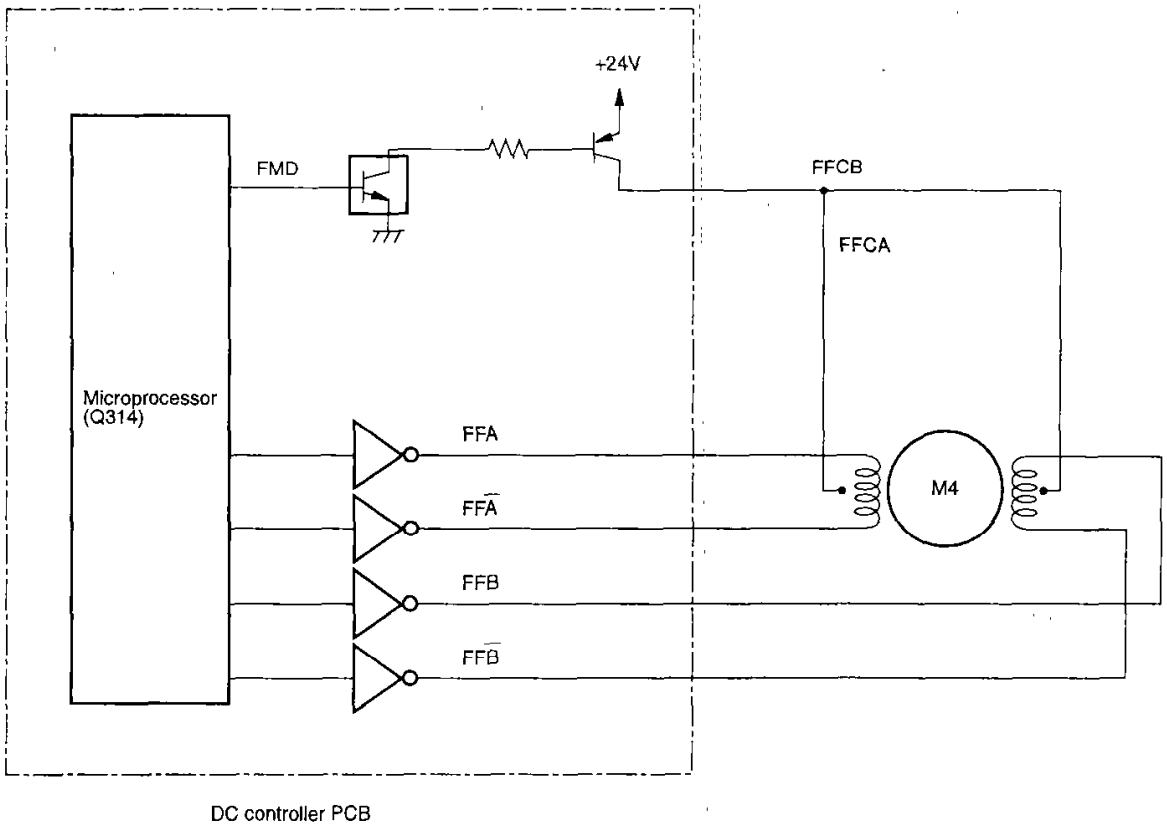

Figure 3-417

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F. Identifying Jams

As many as six (3 in the cassette feeding unit) are used to monitor the movement of copy paper:

- registration sensor (PS6)
- separation sensor (PS7)
- delivery sensor (PS8)

A jam is identified in terms of the presence/absence of paper at the respective sensors at such times as stored in the microprocessor.

The copier has a mechanism to remember how many copies remain to be made after a jam and the current copy mode; it still retains such information even when it is deprived of power by opening of the front cover.

The microprocessor has the jam detection sequence that is described below and, further, identifies the presence of paper as detected by a sensor at power-on.

When the copier identifies a jam, it immediately stops the ongoing copying operation and cuts off the power to the fixing heater (H1); at the same time, it flashes the Jam indicator on the control panel and flashes also any of the location indicator.

The activation of the jam detection mechanism will not increment the copy count for the copy which has jammed.

1. Pre-Registration Delay Jam

Copy paper does not reach the registration sensor (PS6) within a specific period of time after the pick-up clutch (CL2) has gone on because of feeding problems.

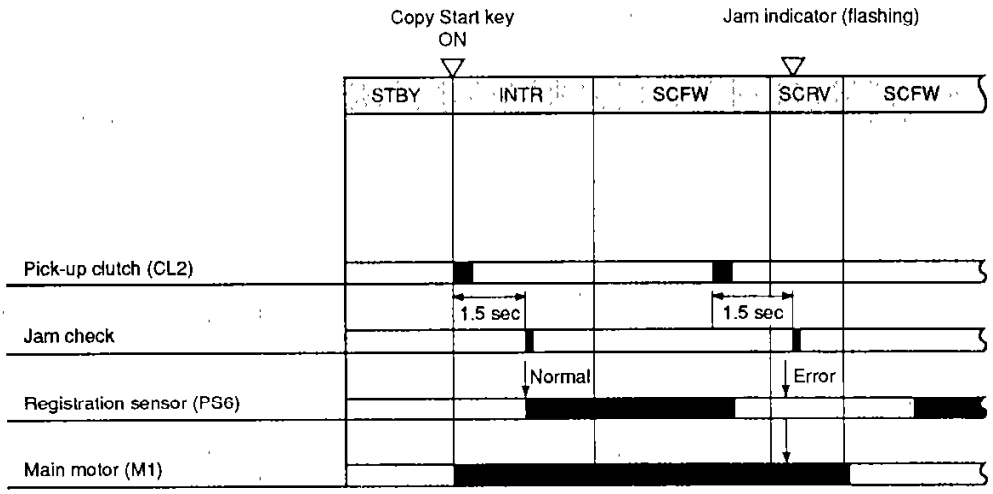

Figure 3-418 Pre-Registration Delay Jam Sequence

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2. Pre-Registration Timing Jam

Copy paper reaches the registration sensor (PS6) before a specific period of time after the pick-up clutch (CL2) has gone on because of feeding problems.

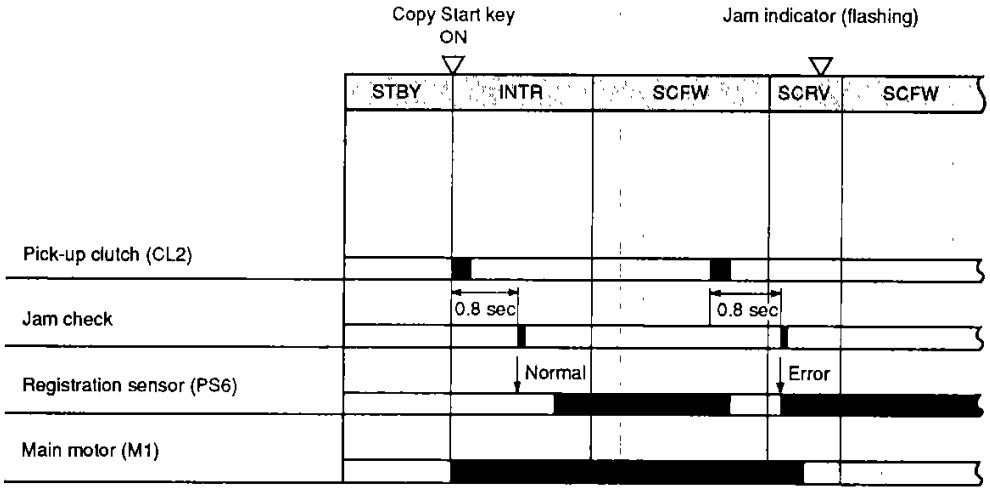

Figure 3-419 Pre-Registration Timing Jam Sequence

3. Pre-Registration Stationary Jam

Copy paper does not move past the registration sensor (PS6) within a specific period of time after the pick-up clutch (CL2) has turned on because of feeding problems.

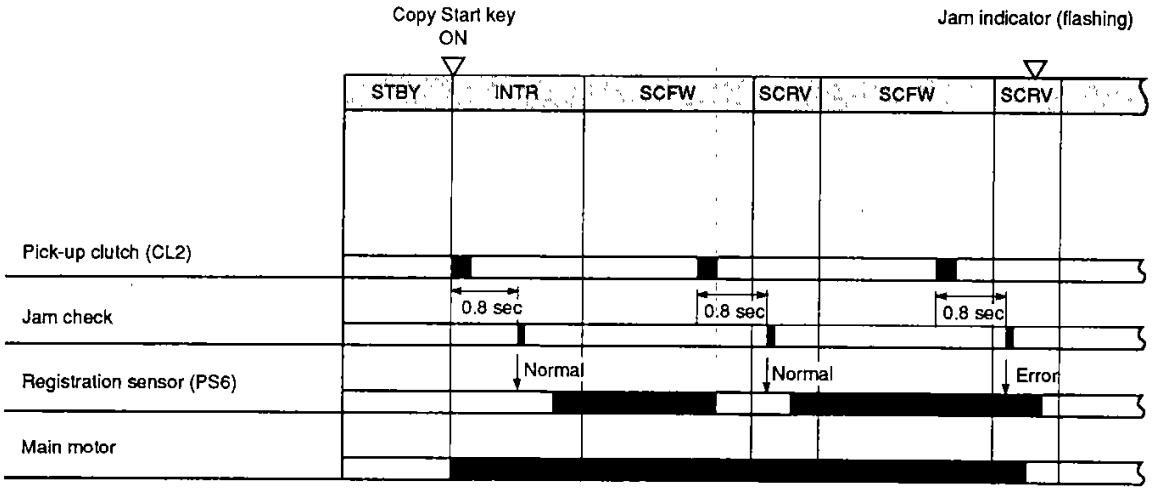

Figure 3-420 Pre-Registration Stationary Jam Sequence

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4. Separation Delay Jam

Copy paper does not reach the separation sensor (PS7) within a specific period of time after the registration clutch (CL1) has gone on because of feeding problems.

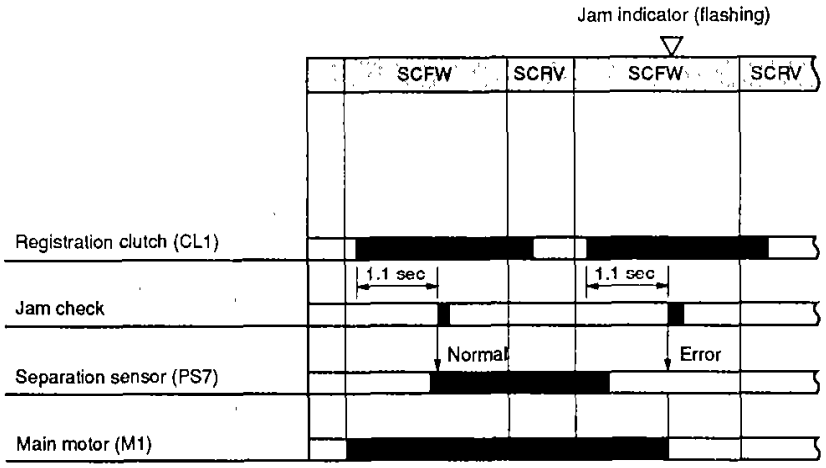

Figure 3-421 Separation Delay Jam Sequence

5. Separation Stationary Jam

Copy paper does not move past the separation sensor (PS7) within a specific period of time after the registration clutch (CL1) has gone on because of feeding problems.

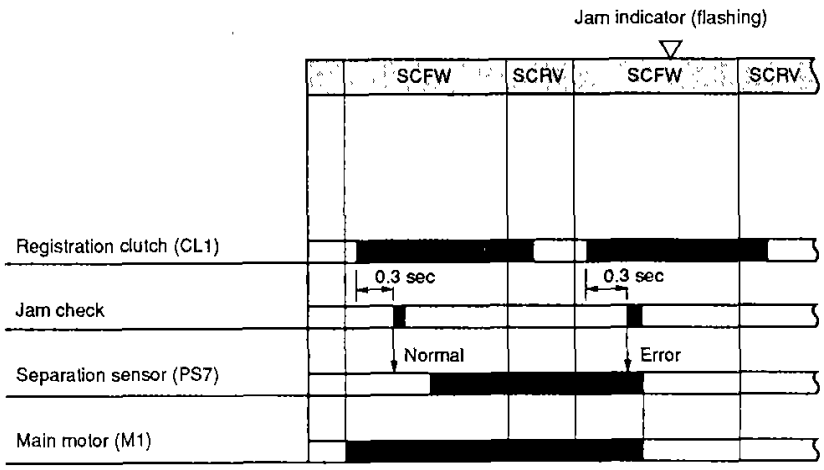

Figure 3-422 Separation Stationary Jam Sequence

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6. Delivery Delay Jam

Copy paper does not reach the delivery sensor (PS8) within a specific period of time after it has moved past the separation sensor (PS7) because of feeding problems.

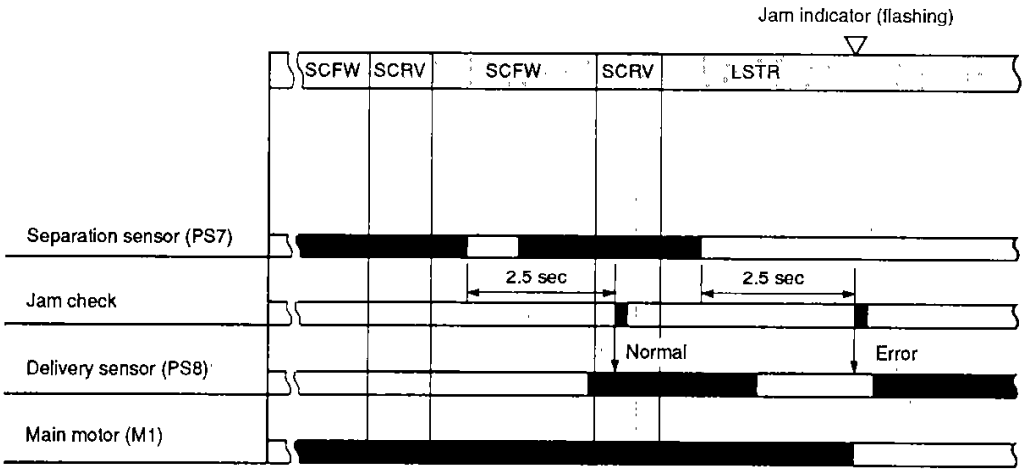
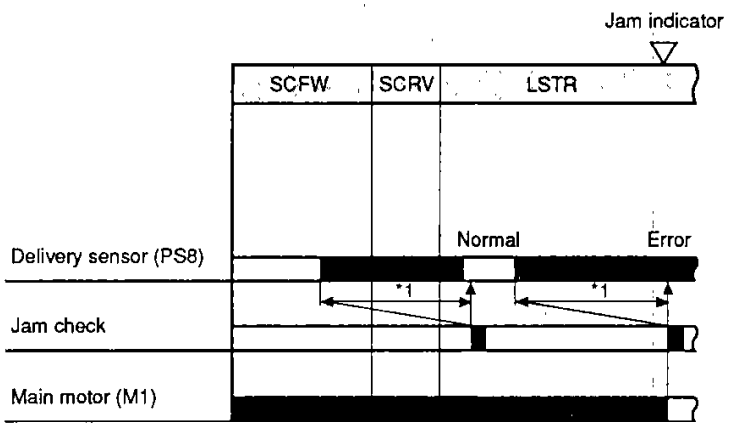


Figure 3-423 Delivery Delay Jam Sequence

7. Delivery Stationary Jam

Copy paper does not move past the delivery sensor within a specific period of time after the delivery sensor (PS8) has gone on because of feeding problems.



*1 Varies depending on the length of paper (paper length + 40 mm).

Figure 3-424 Delivery Stationary Jam Sequence

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V. POWER SUPPLY

A. Outline

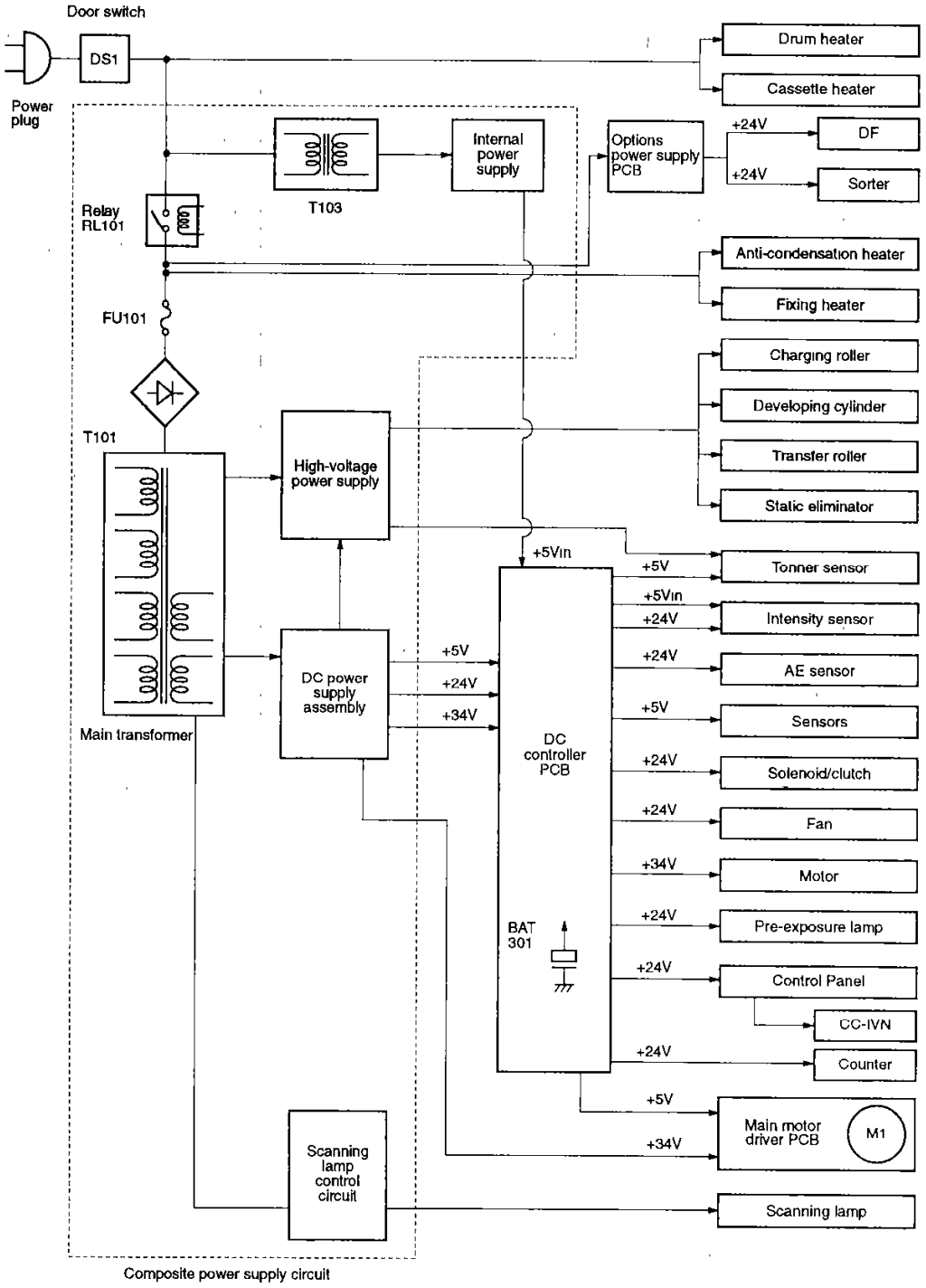

Figure 3-501

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B. Power Supply Circuit Assembly

The copier's power supply assembly is a composite power supply circuit which uses a single main transformer (T101) as the source of DC power, high-voltage power, and power for the fluorescent lamp.

AC power is supplied to the DC power supply assembly when the power switch (SW829) and the door switch are turned on.

When the power switch on the control panel is pressed, signals are sent to the composite power supply assembly to generate internal power supply +5 Vin.

In response, the microprocessor (Q512) turns on to turn on relays RL101 and RL501 to supply power.

The DC power supply generates +34 V, +24 V, and +5 V.

When the power switch is pressed for a second time, the microprocessor turns off RL501 and the main transformer; thereafter, it turns off Q503 to turn off RL101, thereby cutting off +5 Vin.

The condition deprives the DC controller circuit of DC power; to compensate for the absence of power, a lithium battery (BAT301) is provided to back up the data in the RAM (Q307) in the DC controller circuit.

Caution:
Voltage is supplied up to the AC power supply even when the power is off.

Caution:
Replace the lithium battery only with the one listed in the Parts Catalog. Use of a different battery may present a risk of fire or explosion. The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, or dispose of it in fire. Keep the battery out of reach of children and discare any used battery promptly.

Reference:
The tolerances for the DC voltage are as follows:
- +34 V ±20%
- +24 V ±5%
- + 5 V ±5%

However, the above applies only when the error in the AC input is limited to ±10%.

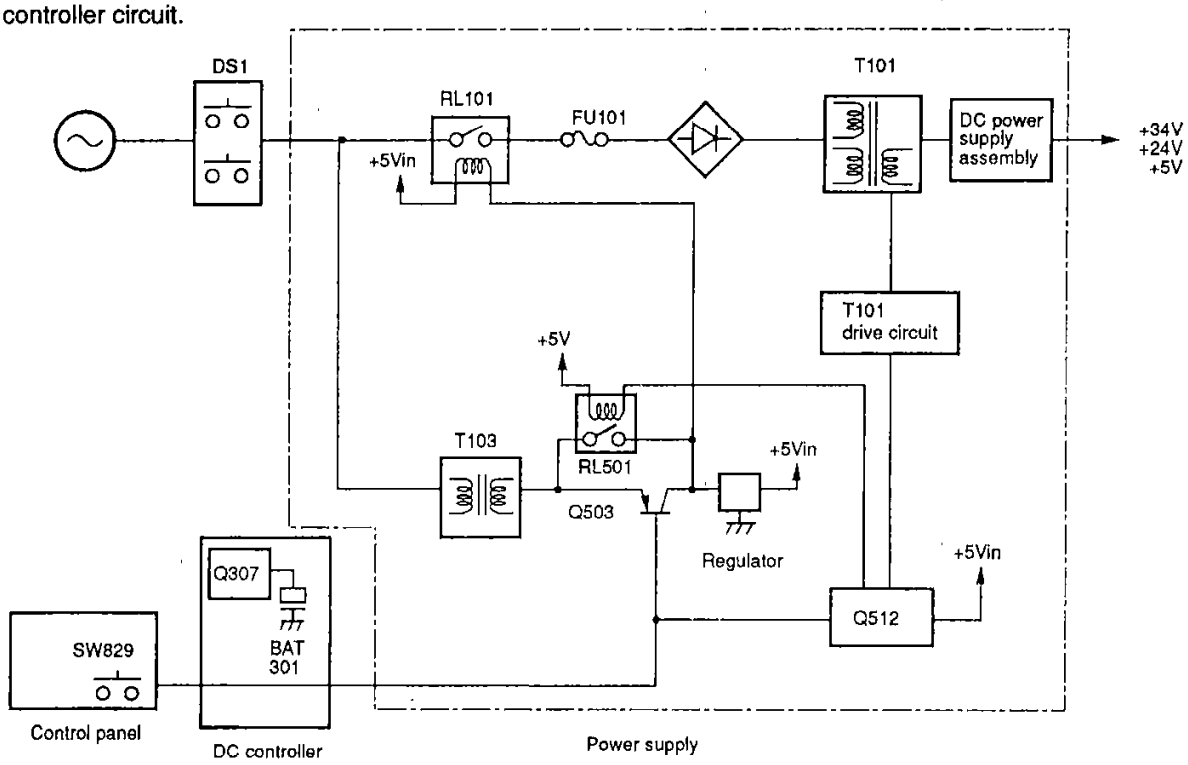

Figure 3-502

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C. Detecting Errors in the Power Supply PCB

The microprocessor (Q512) on the composite power supply PCB either displays an error message on the display by communicating with the DC controller or flashes LED501 to indicate the presence of an error if any of the following is identified.

- **Communication Error between DC Controller PCB and Composite Power Supply PCB**

If an error occurs in the communication between the DC controller PCB and the composite power supply PCB, E240 is indicated as soon as it is detected by the microprocessor on the DC controller PCB. If an error is detected by the composite power supply, the LED is flashed at intervals of 5 sec.

- **Error in the High-Voltage Output Data**

If the difference between the setting associated with the high voltage generated by the microprocessor (Q512) on the composite power supply PCB and the control value is greater than the specified value, the microprocessor (Q512) sends error data to the DC controller PCB, which in turn indicates E064.

- **Low-Voltage Output Data Error**

If the difference between the setting associated with the low voltage generated by the microprocessor (Q512) on the composite power supply PCB and the control value is greater than the specified value, the microprocessor (Q512) communicates with the DC controller PCB, which in turn indicates E803.

- **Overcurrent in the Low-voltage Power Supply**

If the composite power supply PCB identifies overcurrent because of an error in a DC load or wire is trapped, the LED is flashed at intervals of 2 sec for 20 sec.

Reference:
Normally, the LED is flashing at intervals of 0.5 sec.

D. Protection Mechanisms for the Power Supply Circuit

The composite power supply PCB is equipped with an overcurrent detection circuit; if a short circuit occurs in a load for some reason, the protection mechanism is activated to stop the output.

When the output is cut out, you may reset the output by opening the front door to turn off the door switch, correcting the load, and turning on the door switch and power switch (SW829) once again.

Caution:
Be sure to disconnect the connector (J4) of the fixing heater before resetting the output. Repeated short circuiting and resetting can cause the built-in fuse (FU101) to blow.

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VI. SERVICE MODE

A. Outline

The copier's service mode may be classified into the following six:

No.	Description
[1]	control display mode
[2]	I/O display mode
[3]	adjustment mode
[4]	operation/inspection mode
[5]	specification mode
[6]	counter mode

Table 3-600

B. Using Service Mode

1. Activating Service Mode

1) Open the front door, and insert the door switch actuator.
   - If you want to make checks for I/O display mode or the like while making copies, set the copy mode.
2) Press the service mode switch (SW302) on the DC controller with hex key.
   - The copy count indicator indicates [1].
   - While service mode is activated, the copy density indicator LED indicates the position of the fixing belt.
   - A press on the reset key de-activates service mode.

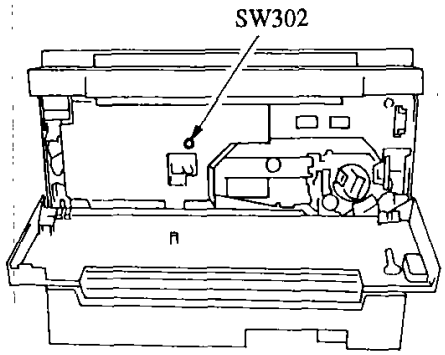

Figure 3-600

2. Selecting a Service Mode

1) While the copy count indicator is indicating [1], press a key from [1] through [6] to select the appropriate mode.
2) Press the AE key.
   - The copier activates the selected mode, and the copy count indicator indicates '301' or the like; '301' represents the first mode of those represented by [3].

3. Selecting Items

1) While the 100th digit on the copy count indicator is flashing ('301' or the like), press the keypad to select the mode to execute.
   - The copy count indicator indicates the selected number; only the 100th digit is flashing.
   - A press on the Clear key returns to selecting a mode ([3] or the like).
2) Press the Start key.
   - The copier activates the specified mode.

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4. Using Adjustment Mode [3] and Specification Mode [5]

1) Press the keypad, and change the setting.
   - The value is flashed.
   - If the value is a negative value, '%' turns on. To enter a negative value, press the % key, and then enter the number using the keypad.
2) Press the AE key.
   - The copier stores the value, and flashes it.
   - A press on the Start key starts copying operation.
3) To change the settings continuously, repeat steps 1) and 2).
4) A press on the Clear key returns to selecting items.

5. Using Operation/Inspection Mode [4]

1) A press on the Start key executes the selected service mode.
2) A press on the Stop key stops the operation and then returns to selecting items.
   - If the mode is of a type that stops automatically, the operation stops and returns to selecting items automatically.

6. Clearing Stored Error Code

If E000, E001, E002, E003, E004, or E007 is indicated, remove the cause of the error, and clear the back-up information.

1) Open the front door, and insert the door switch actuator.
2) While holding down the service mode switch (SW302) on the DC controller with a hex key, press the power switch.
3) In about 2 sec, the power goes off; press the power switch once again.

Note:
The copier turns itself off automatically if it detects E000, E001, E002, E003, or E004, not responding to a press on the power switch. To check the error in service mode, perform the above after disconnecting the connector of the heater.

7. Recording on the Service Mode Label

Figure 3-601 shows the label attached behind the front door. At the factory, each machine is adjusted, and the settings used at the time are recorded on the label.

You must record new settings if you changed them in the field. If you replaced the DC controller, be sure to store the settings recorded on the label in service mode.

In addition, if you have replaced the drum unit or composite power supply, enter the settings recorded on the service label attached to the new drum unit or composite power supply and, at the same time, copy the setting on the service label (Figure 3-601).

No.		TYP		
301	AE_LIGHT			
302	AE_SHIFT			
303	AE_SLOPE			
304	HEATER			
305	REGIST			
306	LE_BLANK			
307	REGIST_R			
308	LE_BLANK_R			
309	TE_BLANK			
310	TE_BLANK_MF			
311	B_HOME			
312	B_HOME_RE			
313	PRIMARY			
314	IP_OFST			
315	PW_OFST			
316	IP_ADJ			
317	PH_ADJ			
318	ATVC_STD			
319	MF_LOOP			
320	C1_LOOP			
321	C2_LOOP			
322	C3_LOOP			
323	C1_CL_OFF			
324	C2_CL_OFF			
325	C3_CL_OFF			
326	LIGHT			

Figure 3-601

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C. Control Display Mode [1]

- To select an item, press the appropriate key on the keypad and then the Start key.
- To clear an item, press the Clear key.
- A press on the Start key while a service mode is indicated executes the respective operation.

No.	Description	Remarks
101	Jam location	The display indicates the location of the jam on the copy count indicator; see below.
102	Fixing belt sensor ON time	unit: ms The actual ON time is the value that is obtained by multiplying the indicated value by 2.56; the copy density indicator indicates the position of the belt.
103	Power supply voltage	unit: V
104	Primary charging voltage	unit: V The actual primary charging voltage is the value obtained by turning the displayed value into negative and subtracting 1000 from it.
105	Primary charging current	unit: μA
106	Intensity	unit: lux The actual intensity (lux) is the value obtained by dividing the displayed value by 100.
107	Jam history	See below.
108	Error history (E code)	The display indicates a history of the most recent three errors; a press on [1], [2], or [3] on the keypad indicates the most recent, second recent, and third recent errors respectively.
109	Temperature detected by fixing main thermistor (TH1)	unit: °C
110	Temperature detected by fixing sub thermistor (TH2)	unit: °C
111	Temperature detected by ambient thermistor (TH301; DC controller)	unit: °C
112	AE sensor output	Normal if the value changes for each original in AE mode.
113	ROM version number	Indicates the parts number of the ROM.
114	ROM release number	Indicates the version of the program.
116	Intensity at time of scanning	Normal if between 68 and 72.

Table 3-601

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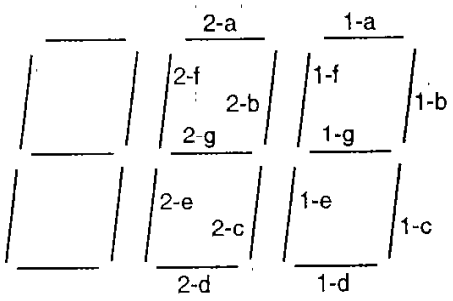
No. 101 Jam Location Indicator

In this mode, the copy count indicator turn on to indicate the type of jam. If both delay and stationary are indicated for the same sensor, i.e., at time of power-on or standby, the copier has detected copy paper when it was not making copies.



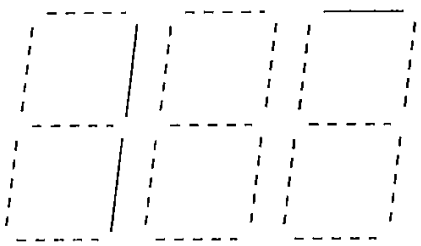
LED (ON)	Jam
1-a	pre-registration delay jam
1-b	pre-registration stationary jam
1-c	separation delay jam
1-d	separation stationary jam
1-e	delivery delay jam
1-f	delivery stationary jam
1-g	not used
2-a	door open
2-b	not used
2-c	not used
2-d	not used
2-e	not used

Table 3-602

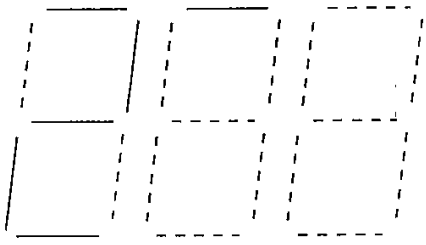
No. 107 Jam History

The 100th digit of the copy count indicator indicates how recent the jam is; to indicate the jam that occurred second most recently, press [2] on the keypad. As in 'No. 101' (jam location), the 10th digit indicates the type of jam.

Example: The most recent jam is a pre-registration delay jam.



The second most recent jam is a door open jam.



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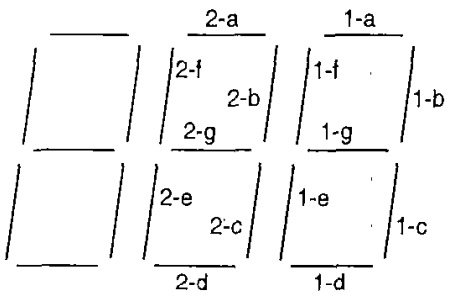
D. I/O Mode [2]

- Press [2] on the keypad and the AE key to activate I/O display mode.
- To clear an item, press the Clear key.
- A press on the Start key while a service mode is indicated executes the respective operation.

No.	Description	Remarks
201	Port C digit 4	When the mode is activated, the copy count indicator turns on to indicate the I/O of the input port; see below.
202	Port C digit 5	When the mode is activated, the copy count indicator turns on to indicate the I/O of the input port; see below.
203	Port C digit 6	When this mode is activated, the copy count indicator turns on to indicate the I/O of the input port; see below.
204	Port C digit 7	When this mode is activated, the copy count indicator turns on to indicate the I/O of the input port; see below.
205	Port H	When this mode is activated, the copy count indicator turns on to indicate the I/O of the input port; see below.
206	Fixing main thermistor (TH1) voltage	Indicates the measurement of voltage using 0 through 255.
207	Fixing sub thermistor (TH2) voltage	Indicates the measurement of voltage using 0 through 255.
208	AE sensor voltage	Indicates the measurement of voltage using 0 through 255.
209	Ambient temperature thermistor (TH301) voltage	Indicates the measurement of voltage using 0 through 255.
210	Multifeeder paper width sensor voltage	Indicates the measurement of voltage using 0 through 255.
211	Intensity sensor voltage	Indicates the measurement of voltage using 0 through 255.
212	Copy density correction knob voltage	Indicates the measurement of voltage using 0 through 255.
213	Toner level sensor	Indicates the measurement of voltage using 0 through 255.

Table 3-603

LED (copy count indicator; from 201 to 205)



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No. 201/202/203/204 Port C Digital Display

No.	LED	Description	Remarks
201	1-a	Cassette 2 connect	ON: connected
	1-b	Cassette 2 connect	ON: connected
	1-c	Options counter open circuit	ON: open
	1-d	Jumper connector 3	ON: connected
	1-e	Cassette size 1 (cassette 2)	ON: light-blocking plate present
	1-f	Cassette size 2 (cassette 2)	ON: light-blocking plate present
	1-g	Cassette size 3 (cassette 2)	ON: light-blocking plate present
	2-a	Cassette size 4 (cassette 2)	ON: light-blocking plate present
	2-b	Not used	
202	1-a	Main motor lock	ON: locked
	1-b	Control Card IV connect	ON: connected
	1-c	Total counter connect	ON: connected
	1-d	Option counter connect	ON: connected
	1-e	Cassette size 1 (cassette 3)	ON: light-blocking plate present
	1-f	Cassette size 2 (cassette 3)	ON: light-blocking plate present
	1-g	Cassette size 3 (cassette 3)	ON: light-blocking plate present
	2-a	Cassette size 4 (cassette 3)	ON: light-blocking plate present
	2-b	Not used	
203	1-a	Service mode switch	ON: pushed
	1-b	Jumper connector 1	ON: connected
	1-c	Jumper connector 2	ON: connected
	1-d	Total counter open circuit	ON: open
	1-e	Cassette size 1 (cassette 1)	ON: light-blocking plate present
	1-f	Cassette size 2 (cassette 1)	ON: light-blocking plate present
	1-g	Cassette size 3 (cassette 1)	ON: light-blocking plate present
	2-a	Cassette size 4 (cassette 1)	ON: light-blocking plate present
	2-b	Cassette 3 vertical path sensor (PS3cu)	ON: light-blocking plate present
204	1-a	Right door open/closed sensor (PS10)	ON: light-blocking plate present (paper present)
	1-b	Separation sensor (PS7)	ON: light-blocking plate present (right door closed)
	1-c	Cassette paper sensor (PS4)	ON: light-blocking plate present (paper absent)
	1-d	Multifeeder paper sensor (PS5)	ON: light-blocking plate present (paper absent)
	1-e	Cassette 2 paper sensor (PS2cu)	ON: light-blocking plate present (paper absent)
	1-f	Cassette 3 paper sensor (PS4cu)	ON: light-blocking plate present (paper absent)
	1-g	Delivery sensor (PS8)	ON: light-blocking plate present (paper present)
	2-a	Cassette right door open/closed sensor (PS5cu)	ON: light-blocking plate present (right door closed)
	2-b	Cassette 2 vertical path sensor (PS1cu)	ON: light-blocking plate present (paper present)

Table 3-604

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No. 205 Port H Display

LED	Description	Signal	Connector	Remarks
1-a	Registration sensor	RPD	J314-2	ON: paper present
1-b	PCB check	PCBCH*	J353-6	For factory only
1-c	Lens home position sensor (PS2)	LHP	J307-2	ON: at HP
1-d	Blank shutter home position sensor (PS3)	BSHP	J315-2	ON: at HP
1-e	Fixing film sensor (PS9)	FFD	J304-12	ON film detected
1-f	Heater on detection (triac short circuit)	HTON*	J324-2	ON: heater ON detected
1-g	Composite power supply ACK	CP-ACK	J302-12	ON: acknowledged
2-a	AC pulse	AC-MNTR	J302-14	ON: H, OFF: L
2-b	ROM serial input	EEP-SI	J323-4	

Table 3-605

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E. Adjustment Mode [3]

- To activate adjustment mode, press [3] on the keypad and then the AE key.
- To select an item, press the appropriate key on the keypad and then the Start key.
- To change the setting, press the appropriate keys on the keypad and then the AE key.
- To cancel an item, press the Clear key.
- A press on the Start key executes the respective operation.
- If the value is a negative value, '%' is turned on; to enter a negative value, press the % key and the value on the keypad.

No.	Description	Settings	Remarks
301	Automatic lamp intensity adjustment for AE scans		See p. 3-83.
302	Copy density (development bias) reference point adjustment for AE mode	–26 ~ +26	See p. 3-83. default: 0
303	Copy density (development bias) slope adjustment for AE mode	–26 ~ +26	See p. 3-83. default: 0
304	Fixing heater resistance storage		See p. 3-88.
305	Leading edge margin adjustment (registration roller ON timing)	0 ~ 63	A higher value delays the copy paper in relation to the image, reducing the margin. default: 32 unit: 0.27 mm
306	Leading edge non-image width adjustment (timing at which blank open/close shutter for blank exposure is closed)	0 ~ 63	A higher setting increases the leading edge non-image width. default: 32 unit: 0.27 mm
307	Leading edge registration adjustment for right face in page separation (registration roller ON timing)	0 ~ 63	A higher setting delays the copy paper in relation to the image. default: 32 unit: 0.27 mm
308	Leading edge margin adjustment for right face in page separation (timing at which blank shutter is closed)	0 ~ 63	A higher setting increases the leading edge margin. default: 32 unit: 0.27 mm
309	Trailing edge non-image width adjustment (timing at which open/close shutter for blank exposure is opened)	0 ~ 63	A higher setting reduces the trailing edge margin. default: 32 unit: 0.27 mm
310	Leading edge non-image width for multifeeder (timing at which the open/close shutter for blank exposure is opened)	0 ~ 63	A higher setting reduces the trailing edge margin. default: 32 unit: 0.27 mm

Table 3-606-1

Note: A press on the Start key when in No. 305, 306, 307, or 308 makes copies in the mode that has been effective before the activation of the mode; when executing No. 307 or 308, it is recommended that page separation mode be selected before activating service mode.

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No.	Description	Settings	Remarks
311	Left/right margin adjustment (Direct; home position for slide shutter for blank exposure)	0 ~ 15	A higher setting increases the margin on both left and right. default: 8 unit: 0.27 mm
312	Left/right margin adjustment (Reduce; travel distance of slide shutter for blank exposure)	–10 ~ +10	A higher setting increases the margin on both left and right. default: 0 unit: 0.27 mm
313	Primary output voltage correction (corrects output voltage determined by APVC)	–16 ~ +16	Enter the setting recorded on the label after replacing the drum cartridge.
314	APVC measured current shift (corrects the results of APVC)	–40 ~ +40	Enter the setting recorded on the label after replacing the drum cartridge.
315	Voltage correction for measurement in APVC (corrects voltage for measurement applied at time of APVC)	–16 ~ +16	default: 0 unit: 16 V Enter the value recorded on the label on the composite power supply when replacing the composite power supply.
316	Measurement current correction for APVC (corrects current measured at time of APVC)	–10 ~ +10	default: 0 Enter the value recorded on the label on the composite power supply when replacing the composite power supply.
317	Fluorescent lamp pre-heating current adjustment	–9 ~ +9	default: 0 Enter the value recorded on the label on the composite power supply when replacing the composite power supply.
318	Transfer output voltage adjustment (corrects transfer voltage determined by ATVC)	–4 ~ +4	default: 0 unit: 10 V Convert the value recorded on the label on the composite power supply as follows and change the value recorded on the service label; then, enter the value when replacing the composite power supply. Label → Input: 1 → 0, 2 → –1, 3 → –2, 4 → –3, 5 → –4 Label → Input: 6 → +1, 7 → +2, 8 → +3, 9 → +4
319	Arch adjustment when multifeeder is used (pick-up roller OFF timing)	0 ~ 63	A higher setting increases the arch. default: 25 unit: 0.27 mm
320	Arch adjustment when cassette2 is used (pick-up roller OFF timing)	0 ~ 63	A higher setting increases the arch. default: 25 unit: 0.27 mm
321	Arch adjustment when cassette 2 is used (pick-up roller OFF timing)	0 ~ 63	A higher setting increases the arch. default: 25 unit: 0.27 mm
322	Arch adjustment when cassette 3 is used (pick-up roller OFF timing)	0 ~ 63	A higher setting increases the arch. default: 25 unit: 0.27 mm

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No.	Description	Settings	Remarks
323	Pick-up clutch (CL2) off timing adjustment	0 ~ 63	For factory only default: 32
324	Cassette 2 pick-up clutch (CL1cu) off timing adjustment	0 ~ 63	For factory only default: 20
325	Cassette 3 pick-up clutch (CL1cu) off timing adjustment	0 ~ 63	For factory only default: 20
326	Scanning lamp intensity adjustment	0 ~ 76	For factory only default: 75

Table 3-606-2

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F. Operation/Inspection Mode [4]

- To activate operation/inspection mode, press [4] on the keypad and then the AE key.
- To select an item, press the appropriate key on the keypad and then the Start key.
- To execute the mode, press the Start key.
- To stop the operation, press the Stop key; the copier returns to selecting an item.
- If the mode is of a type that stops automatically, the copier automatically returns to selecting an item.

No.	Description	Remarks
401	Developing assembly idle rotation	Use it after supplying toner at time of installation.
402	Primary roller cleaning	
403	Transfer roller cleaning	
404	Fixing tension roller	Use it to adjust the fixing film drive roller pressure for the upper fixing unit. (See p. 4-33.) Fix the fixing tension roller and cause the fixing film to rotate idly. The ON period of the fixing film sensor is indicated by the copy count indicator, and the film position is indicated by the copy density indicator. Another press on the Start key checks the position of the fixing film automatically.
405	Fixing film initial rotation mode	Execute the mode when you have replaced the fixing film or the upper fixing unit to return the fixing film to its appropriate position. (See p. 4-41.) The film stops as soon as it reaches the appropriate position automatically. The position of the film in travel is indicated by the copy density indicator.
406	Nip check	Use tit to check the nip or when adjusting the lower fixing roller. (See p. 4-43.)
407	Fixing film displacement correction	The fixing film stops when it reaches the appropriate position or when 30 sec has passed. The position of the film in travel is indicated by the copy density indicator, and the fixing film ON period is indicated by the copy count indicator. The position is normal if the copy density indicator indicates '5' when the film stops; otherwise, check the fixing film and the tension roller. If the fixing film becomes displaced and E007 is indicated, try this mode. (This will prove to be highly useful if displacement occurs because of a minor accident.)
408	Scanning lamp ON check	A press on the Start key keeps the lamp on after about 1.5 sec.
409	Control panel indicators ON	
410	Scanner forward stop	
411	Pre-exposure lamp on	
450	Back-up RAM clear	See p. 3-90.

Table 3-607

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G. Specification Settings Mode [5]

- To activate specification settings mode, press [5] on the keypad and then the AE key.
- To select an item, press the appropriate key on the keypad and then the Start key.
- To change the setting, press the appropriate keys on the keypad and then the AE key.
- To clear an item, press the Clear key.
- A press on the Start key executes the respective operation.

No.	Description	Remarks
501	Characteristics storage for multifeeder paper width sensor	See p. 3-87.
502	Copy density notation switching (9/17 steps)	9 steps: 0 17 steps: 1 default: 0 (9 steps)
503	Auto power-off cancel	• When '1' is entered on the keypad, the notation will be 'ON', activating the auto power-off function. • When '0' is entered on the keypad, the notation will be 'OFF', de-activating the auto power-off function. default: on. The auto power-off period is set in user mode; since the copier's WAIT time is 0, it is best to keep the auto power-off mechanism to be enabled.
504	Copy count upper limit	settings: 0 to 99 default: 0 When set to '0', the upper limit will be 100 copies.
505	Universal cassette paper size	See p. 3-87. settings: 0 to 14 default: 0
506	Separation static eliminator output voltage switching	002: 2.5 kV 004: 4 kV default: 0
507	Fixing forced wait	When activated, the period of initial rotation is increased; activate it if the fixing on the first copy is poor because of low temperature conditions. 0: disabled 1: enabled default: 0
508	Fixing control temperature switching	001: 225°C 002: 215°C 003: 200°C default: 002 See p. 3-89.

Table 3-608

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H. Counter Mode [6]

- To activate the mode, press [6] on the keypad and then the AE key.
- To select an item, press the appropriate key on the keypad and then the Start key.
- To cancel an item, press the Clear key.
- A press on the Start key executes the respective service operation.
- To obtain the actual count, multiply the indication by 100.

No.	Description	Remarks
601	Large copy counter	
602	Small copy counter	
603	Total copy counter/drum counter	For North America only; indicates the use of the drum unit in terms of copies made, and cleared when the drum unit is replaced.

Table 3-609

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VII. ELECTRICAL

1 After Replacing the PCB

You must make the adjustments that follow whenever you have replaced the following PCBs.

a. DC Controller PCB

1) Enter the value recorded on the service mode label attached behind the front door in service mode ('3'; see p. 3-77).
2) Adjust the multifeeder paper width sensor; see p. 3-87.
3) Adjust the intensity of the scanning lamp; see p. 3-83.
4) Adjust AE; see p. 3-83.

As necessary, change the settings in service mode and user mode.

Caution:
Be sure to record all new settings that you have entered.

b. Composite Power Supply PCB

1) Enter the values recorded on the label attached to the composite power supply in service mode ('No. 315' through 'No. 318'; '3' of adjustment mode); see p. 3-77.

Be sure to record any new settings on the service mode label.

c. AE Sensor PCB

1) Adjust AE; see p. 3-83.

Caution:
Be sure to record all new settings that you have entered.

d. Intensity Sensor PCB

1) Adjust the intensity of the scanner lamp; see p. 3-83.
2) Adjust AE; see p. 3-83.

Caution:
Be sure to record all new settings that you have entered.

2 Adjusting the Scanning Lamp Intensity

Turn VR301 on the DC controller as follows whenever you have replaced the scanning lamp, intensity sensor, or DC controller.

1) Set Test Sheet NA3 or NB3 on the copyboard, and close the copyboard cover.
2) Make copies in continuous mode with AE off and at copy density 5.
3) Turn VR301 on the DC controller so that the image is optimum.
   - If the image is too light, turn the VR slightly clockwise.
   - If the image is too dark, turn the VR slightly counterclockwise.

Reference:

1. The term *optimum image* refers to a copy whose gray scale No. 8 corresponds to gray scale No. 4 through 7 of the Test Sheet without fogging.
2. An excessive turn on the VR could put out the lamp. If that is the case, turn it clockwise until it stops, and turn off and then on the power for re-adjustment.

Caution:
Be sure to execute AE adjustment after these adjustments.

3 AE Adjustment

Adjust the AE mechanism using the following three service modes:

① AE Basic Adjustment
- No. 410 scanner forward stop
- No. 408 scanning lamp on check
- No. 208 AE sensor voltage display
- No. 301 lamp intensity automatic adjustment at time of AE scan

② Copy Density in AE Mode (No. 302) (developing bias) reference adjustment

③ Copy Density in AE Mode (developing bias) slope adjustment

If the copy density is not optimum after executing AE basic adjustment ① (No. 410, No. 408, No. 208, No. 301), execute ② and then , if necessary, ③, i.e., No. 302 and No. 303.

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If you have replaced the AE sensor, scanning lamp, or DC controller, adjust the scanning lamp intensity (VR 301); then, execute AE basic adjustment ①, scanner forward stop (No. 410), scanning lamp on check (No. 408), AE sensor voltage display (No. 208), and lamp intensity automatic adjustment (No. 301).

Go through the following when making adjustments; Table 2-201 is a list of service modes excluding scanner forward stop (No. 410, list of service modes excluding scanner forward stop (No. 410), scanning lamp on check (No. 408), and AE sensor voltage display (No. 208).

a. AE Basic Adjustment (No. 410, No. 408, No. 208, No. 301)

In this adjustment, the intensity of the scanning lamp is read by the lamp intensity sensor and the voltage of the AE sensor unit is adjusted by VR 391 on the DC controller. After the adjustment, execute the lamp intensity automatic adjustment for AE scans.

1) Place the Test Sheet NA-3 or NB-3 on the copyboard, and close the copyboard.
   Press the service mode switch (SW302) to activate service mode.
2) Enter '4' using the keypad, and press the AE key.
   • The display indicates '401'.
3) Enter '410' using the keypad.
   • The display indicates '410'.
4) Press the Start key once.
   • The scanner moves forward.

Caution:
Each press moves the scanner forward; do not press more than once.

5) Enter '408' using the keypad, and press the Start key.
   • The display indicates 'ON', and turns off after about 1.5 sec.
6) Press the Clear key twice.
   • The display indicates '201'.
7) Enter '208' using the keypad, and press the start button.
   • The display indicates '208'.
8) Press the Start key.
   • The display indicates '0–255'.
9) Turn VR391 on the DC controller so that the reading on the display is '82–87'.

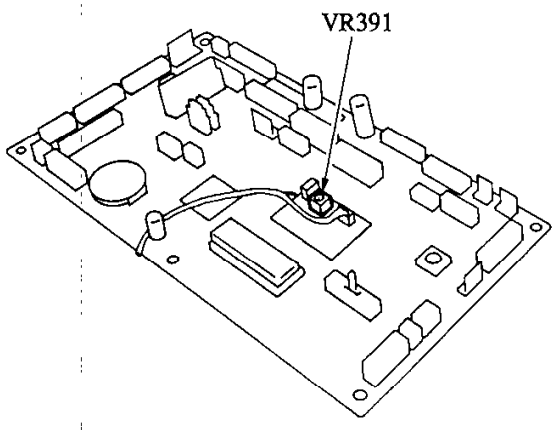

Figure 3-701 DC Controller PCB

10) Turn off and on the power switch.
   • This turns off and on the scanning lamp.
11) Press the service mode switch.
   • The copier enters service mode, and the display indicates '1'.
12) Enter '3' using the keypad, and press the AE key.
   • The display indicates '301'.
13) Press the Start key.

Caution:
Wait until initial rotation is over.

   • After initial rotation is over, the AE indicators starts to flash.
14) Press the AE key; the following take place to indicate that the optimum intensity is adjusted automatically:
   • The AE indicator stops flashing and remains on.
   • The scanner moves to the AE measurement position.
   • When the intensity has stabilized, the reading taken by the AE sensor is stored in memory.
   • The lamp is turned off, and the scanner is returned to its original position.
15) When the above has ended, press the clear key twice.
   • The display indicated '3'.
16) Enter '1' using the keypad, and press the AE key.
   • The display indicates '101'.
17) Enter '116' using the keypad, and press the Start key.

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- Make sure that the display indicates '68–72'; otherwise, start with step 2) of operation/ inspection mode for re-adjustment.

b. Copy Density (development bias) Reference Point Adjustment for AE Mode (No. 302)

1) If the indication is not in the 300's, activate adjustment mode (service mode) as in the case of 'No. 301'.
2) Press [2] on the keypad.
   - The copier indicates '302'.
3) Press the Start key.
   - The copier indicates the current setting.
4) Change the setting using the keypad, and press the AE key.
   - A higher setting causes the AE copies to be darker.
   - default: 0
     range: –26 to +26
   - If the setting is negative, the '%' is indicated. To enter a negative value, press the '%' key, and enter a setting.
   - When the copier has read the setting, the indication stops flashing and remains on.
5) Record the new setting on the service mode label.
6) To end, press the Clear key.
   - The copier returns to selection mode, and indicates '302'.
   - As necessary, execute 'No. 303'.

c. Copy Density (development bias) Slope Adjustment for AE Mode (No. 303)

1) If the indication is not in the 300's, activate adjustment mode (service mode) as in the case of No. 301.
2) Press [3] on the keypad.
   - The copier indicates '303'.
3) Press the Start key.
   - The copier indicates the current setting.
4) Change the setting with the keypad, and press the AE key.
   - A larger setting causes the AE copies to be darker.
   - default: 0
     range: –26 to +26
   - If the setting is negative, '%' is indicated. To enter a negative value, press the '%' key, and enter a setting.
   - When the copier has read the setting, the indication stops flashing and remains on.
5) Record the new settings on the service mode label.
6) Press the Reset key.
   - The copier de-activates service mode.

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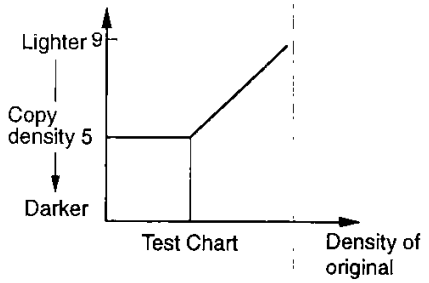
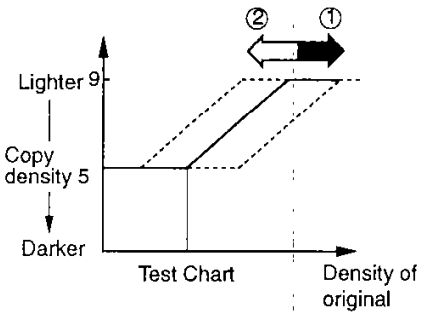
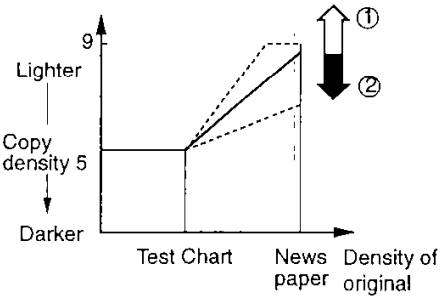
Item	Function	Description	Remarks
No. 301	Automatic lamp intensity adjustment for AE scans		The lamp intensity is automatically adjusted so that the copies of the Test Chart will be made at density 5.
No. 302	Copy density (development bias) reference point adjustment for AE mode		① A lower setting in service mode causes the AE copies to be darker. ② A higher settings in service mode causes the AE copies to be lighter. default: 0 range: –26 to +26
No. 303	Copy density (development bias) slope adjustment for AE mode		① A higher setting in service mode causes copies of a newspaper to be lighter. ② A lower setting in service mode causes copies of a newspaper to be darker. default: 0 range: –26 to +26

Table 3-701

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4 Adjusting the Multifeeder Paper Width Sensor

Store the characteristic of the multifeeder paper width sensor in service mode (501).

Perform the adjustment when you have replaced the sensor if the sensor fails to identify the paper size correctly.

1) Open the front door, and insert the door switch actuator into the door switch.
2) Press the service mode switch (SW302) with a hex key.
   - The copier activates service mode, and indicates '1'.
3) Press [5] on the keypad.
   - The copier indicates '5'.
4) Press the AE key.
   - The copier activate specification settings mode, and indicates '501'.
5) Press the Start key.
   - The copier indicates 'A3'.
6) A press on the keypad changes the indication as shown in Table 3-702. Select the size of paper to change. (Do not select CLR.)
   - The indication will start to flash if you select a size which has not been stored.
   - If you press the Start key when 'CLR' is indicated, the copier clears all stored settings and returns the default settings.
7) Shift the guide on the multifeeder to suit the size to be stored.
   - Be sure to hear a click.
8) Press the AE key.
   - When the setting is stored, the indication stops flashing and remains on.
9) Press the Reset key.
   - The copier de-activates service mode.

Key	Indication	Remarks
1	A3	A3
2	Ldr	Ledger
3	b4	B4
4	LGL	Legal
5	A4r	A4R
6	b5r	B5R
7	A5r	A5R
8	Sr	Statement R
9	JPC	Postcard (100 mm wide)
0	CLr	Clear (clears settings)

Table 3-702

Reference:

1. When storing JPC (No. 9), adjust the guide width to the smallest width.
2. At time of shipment, the settings are A3, A4R, and JPC; the copier retains the characteristics curves of the corresponding three points and uses them when identifying the size of paper during copying operation. When you store a size other than these three, the copier takes the new settings into account when making computations; for this reason, it is best to store sizes that the user tends to use most frequently.

5 Setting the Paper Size for the Universal Cassette

If the paper size lever for the cassette is at the universal cassette, set the appropriate paper size in service mode (505).

1) Open the front door, and insert the door switch actuator into the door switch.
2) Press the service mode switch (SW302) with a hex key.
   - The copier activates service mode, and indicates '1'.
3) Press [5] on the keypad.
   - The copier indicates '5'.
4) Press the AE key.
   - The copier enters machine settings mode, and indicates '501'.
5) Press [0] and [5] on the keypad.
   - The copier indicates '505'.
6) Press the Start key.
   - The copier indicates the current setting for the universal cassette.
7) Select the size to store using the keypad according to Table 3-703.
8) Press the AE key to store the new setting.
9) Press the Reset key.
   - The copier de-activates service mode.

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Keypad	Paper	Size
0	Bolivian OFFICIO	355.0 × 216.0
1	Argentine OFFICIO	340.0 × 220.0
2	Argentine LEGAL	340.0 × 220.0
3	Australian FOOLSCAP	337.0 × 206.0
4	FOOLSCAP	330.2 × 215.9
5	FOLIO	330.0 × 210.0
6	Government LEGAL	330.2 × 203.2
7	Ecuadorian OFFICIO	320.0 × 220.0
8	OFFICIO	317.0 × 216.0
9	Argentine LETTER-R	280.0 × 220.0
10	Korean Govern-ment-R	268.0 × 190.0
11	Government LETTER-R	266.7 × 203.2
12	Argentine LETTER	220.0 × 280.0
13	Government LETTER	203.2 × 266.7
14	Korean Government	190.0 × 268.0

Table 3-703

6 Storing the Fixing Heater Resistance

You must store the resistance of the fixing heater as follows whenever you are replacing the fixing upper unit; do not change the setting unless you have replaced the heater.

1) Take notes of the resistance (ohm) of the fixing heater recorded on the rear side plate of the fixing upper unit.
2) Attach the fixing upper unit to the copier.
3) Open the front door, and insert the door switch actuator into the door switch.
4) Press the service mode switch (SW302) with a hex key.
   - The copier activates service mode, and indicates '1'.
5) Press [3] on the keypad.
   - The copier activates adjustment mode, and indicates '3'.
6) Press the AE key.
   - The copier enters adjustment mode, and indicates '301'.
7) Press [0] and [4] on the keypad.
   - The copier indicates '304'.
8) Press the Start key.
   - The copier indicates the current setting.
9) Enter the measured reading, and press the AE key to store.
10) Record the new setting on the service mode label.
11) Press the Reset key.
   - The copier de-activates service mode.

unit: ohms; for a 100V model, enter a value which is the result of the measured resistance multiplied by 100.
for a 115/220/240V model, enter a value which is the result of the measured resistance multiplied by 10.

range (default)

100V:	640 to 880 (760)
115V:	84 to 116 (100)
220/240V:	235 to 325 (280)

Reference:

1. For a 100V model, if the measured resistance is 7.6 ohms, enter '760'.
   For a 115/220/240V model, if the measured resistance is 9.5 ohms, enter '095'; if 28 ohms, enter '280'.
2. The power supplied to the fixing heater is phase-controlled based on the voltage of the power supply and the resistance being stored.

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7 Setting the Fixing Heater Temperature Control Value

You can change the fixing temperature control value in the field in any of the following two ways:

6.1 When Replacing the Fixing Upper Unit

Set the initial control temperature value for the 1st to 4th copies under No. 508 of service mode for when the temperature of the fixing heater is less than 120°C at time copying is started.

1) Take notes of the value recorded on the label on the fixing upper unit heater stay (rear).

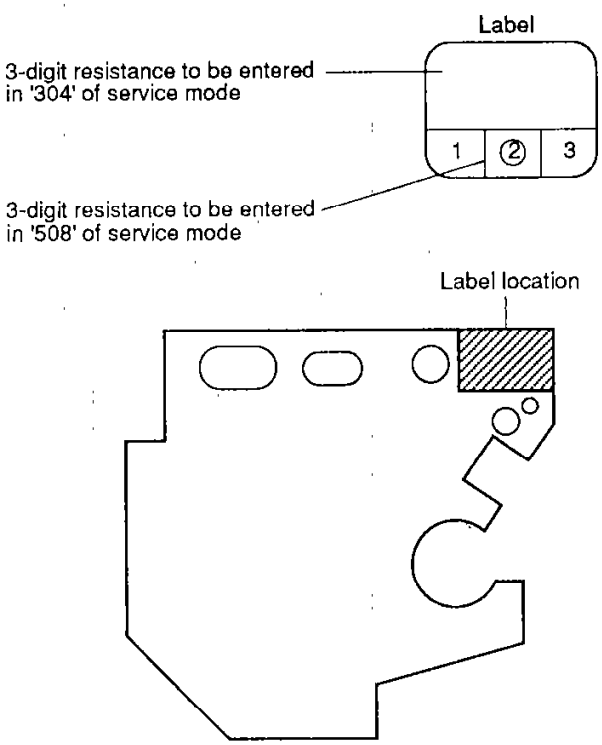

Figure 3-702 Heater Stay Side Plate (rear)

2) Replace the fixing upper unit.
3) Press the service switch (SW302).
   • The copier enters service mode and indicates '1'.
4) Enter '5' using the keypad.
   • The display indicates '5'.
5) Press the AE key, and enter '8' on the keypad.
   • The display indicates '508'.
6) Press the Start key.
   • The display indicates '001', '002', or '003'.
7) Enter the control value you have recorded in step 1) using the keypad.

Example:

If the value recorded on the heater stay (rear) of the fixing upper unit is '2',

a. Enter '2' using the keypad to change the value.
b. Press the AE key.
c. Press the Reset key.

Caution:

You must set the resistance of the heater also when replacing the fixing upper unit.

6.2 When Replacing the Fixing Film

1) Replace the fixing film.
2) Replace the copy paper in the cassette with A3 size copy paper.
3) Press the service switch (SW302).
   • The copier enters service mode and indicates '1'.
4) Enter '5' using the keypad, and press the AE key.
   • The display indicates '501'.
5) Enter '5' using the keypad, and press the Start key.
   • The display indicates '001', '002', or '003'.
6) Enter '2' using the keypad, and press the Clear key.
8) Make 20 copies or more in A3 to warm up the entire fixing upper unit.

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9) Place the Test Chart NA-3 or NB-3 on the copyboard, and put a blank sheet of paper (A3) to cover about 2/3 of the Test Chart (bottom).

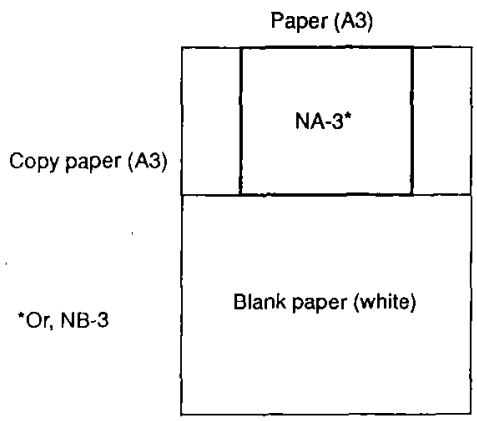

Figure 3-703

10) Enter '4' using the keypad, and set the copy count.
11) Press the service switch (SW302), thereby recalling the temperature of the No. 1 thermistor.
    • The display indicates '1'.
12) Press the AE key, and enter '9' on the keypad.
    • The display indicates '109'.
13) Press the Start key.
    • Make 4 copies in A3.
14) When copying is finished, take note of the temperature reading in the display. Press the Start key once again when the reading is 116°–118°C.
    • Make four copies in A3.
15) Check if offset has occurred.
    • If offset is noted, change the temperature control value of the fixing heater. Go to step 20).
    • If offset is not noted, go to step 27).
16) Press the Clear key, and enter '5' using the keypad.
    • The display indicates '508'.
17) Press the AE key, and enter '8' using the keypad.
    • The display indicates '508'.
18) Press the Start key.
    • The display indicates '002'.
19) Enter '3' using the keypad.
    • The display indicates '003'.
20) Press the AE key.
    • The setting is changed.
21) Press the Reset key.
    • The copier leaves service mode.

8 Clearing the Back-Up RAM

1) Open the front door, and insert the door switch activator into the door switch.
2) Press the service mode switch (SW302) with a hex key.
    • The copier activates service mode, and indicates '1'.
3) Press [4] on the keypad.
    • The copier indicates '4'.
4) Press the AE key.
    • The copier activates operation/inspection mode, and indicates '401'.
5) Press [5] and [0] on the keypad.
    • The copier indicates '450'.
6) Press the Start key.
    • The copier indicates 'noP'.
7) Press the AE key.
    • The indication changes to 'EE'.
8) Press the Start key.
    • The indication returns to '450'.
9) Turn off and on the power switch.
    • The copier clears the backup RAM, and returns the default settings.

Reference:
To cancel RAM clearing, press the Clear key and then the Reset key. To cancel it after having finished step 8), press the Start key once again; when 'noP' is indicated, press the Start key once again.

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VIII. SELF DIAGNOSIS

The microprocessor on the copier's DC controller is provided with a self diagnosis mechanism that checks the condition of the machine (sensors, in particular). The copier runs self diagnosis and, when it identifies an error, indicates a code that represents each specific error. If the copier finds an error associated with E000, E001, E002, E003, and E004, it automatically shuts itself off (error auto power-off).

Code	Cause	Description
E000	• Thermistor (TH1, TH2; displacement, poor contact, open circuit) • Fixing heater (H1; open circuit, crack) • Thermal fuse (FU1; malfunction) • Triac (faulty) • DC controller (faulty)	• The detection temperature of the thermistor (TH1) does not reach 50°C 1 sec after the Copy Start key has been pressed. • The detection temperature of the main thermistor (TH1) does not reach 90°C 2 sec after the Copy Start key has been pressed. • The detection temperature of the sub thermistor (TH2) does not reach 90°C 1 sec after the Copy Start key has been pressed.
E001	• Thermistor (TH1, TH2; short circuit) • Triac (faulty) • DC controller (faulty)	• The detection temperature of the thermistor (TH1) exceeds 250°C during copying operation. • The detection temperature of the sub thermistor (TH2) exceeds 260°C during copying operation. • The detection temperature of the thermistor (TH1, TH2) rises 30°C over the specified temperature during copying operation. • The detection temperature of the thermistor (TH1, TH2) rises 30°C over the specified temperature during copying operation. • The thermistor detects a rise in temperature of 40°C or more during standby. • The temperature has increased over 100°C or more within 1 sec after the thermistor (TH1, TH2) has detected 100°C.
E002	• Thermistor (TH1, TH2; displacement, poor contact, open circuit) • Fixing heater (H1; open circuit, crack) • Thermal fuse (FU1; malfunction) • Triac (faulty) • DC controller (faulty)	• The detection temperature of the main thermistor (TH1) does not reach 105°C 1 sec after it has reached 90°C. • The detection temperature of the main thermistor (TH1) does not reach 130°C 1 sec after it has reached 105°C. • The detection temperature of the main thermistor (TH1) does not reach 135°C 1 sec after it has reached 120°C. • The detection temperature of the main thermistor (TH1) does not reach 150°C 1 sec after it has reached 135°C.

Table 3-801-1

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Code	Cause	Description
E003	• Thermistor (TH1, TH2; displacement, poor contact, open circuit) • Fixing heater (H1; open circuit, crack) • Thermal fuse (FU1; malfunction) • Triac (faulty) • DC controller (faulty)	• The detection temperature of the main thermistor (TH1) is 150°C or less after it has reached 150°C. • The detection temperature of the sub thermistor (TH2) is 90°C or less after it has reached 90°C.
E004	• Triac (faulty) • Heater ON detection PCB (faulty)	The fixing heater is identified as being on when the fixing heater drive signal is off (HTRD=0). **Note:** The 100/115V model does not have a heater on detection PCB and does not detect E004.
E007	• Fixing film (displacement, tear) • Tension roller (displacement, malfunction) • Fixing film motor (M4; faulty) • Fixing film sensor (PS9; faulty)	The fixing film sensor output remains '1' or '0' for 1.35 sec or more. **Reference:** The fixing film takes about 1.3 sec to make a full rotation.
E010	• Main motor (M1; faulty) • DC controller (faulty)	The main motor revolution is not as specified (MLOCK=0) for 1 sec or more while the main motor drive signal is on (MMD=1).
E030	• Counter (open circuit) • DC controller (faulty)	Checks are made immediately before the counter turns on or off and when copying operation is started. Normal if drive signal = 0 at time the counter turns on; Normal if drive signal = 1 at time the counter turns off. **Note:** Checks are made only when the counter is installed.
E064	• Composite power supply (faulty) • DC controller (faulty)	The high voltage of the composite power supply is different from the setting.
E202 (keys on control panel disabled)	• Scanner cable (displacement, tear) • Scanner home position sensor (PS1; faulty) • Scanner motor (M2; faulty) • DC controller (faulty)	The scanner does not return to the home position within 5 sec when it is started. E002 may be checked in 'No. 108' of service mode.
E210	• Lens cable (displacement, tear) • Lens home position sensor (PS2; faulty) • Slide shutter (operation) • Blank shutter home position sensor (PS3; faulty) • Change solenoid (SL1; faulty) • Lens motor (M3; faulty) • DC controller (faulty)	• The lens home position sensor signal (LHP) is not generated within a specific period of time after the power switch has been turned on. • The lens home position signal (LHP) is generated longer than a specific period of time. • The blank shutter home position signal (BSHP) is not generated when the slide shutter is moving.

Table 3-801-2

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Code	Cause	Description
E220	• Scanning lamp (faulty) • Composite power supply (faulty) • DC controller (faulty)	• The lamp is identified as being on during standby. • The lamp is identified as being off during copying operation.
E240	• DC controller (faulty) • Composite power supply (faulty)	A communication error is detected between the CPU (Q301) on the DC controller and the CPU (Q512) on the composite power supply.
E261	• Power supply frequency (fluctuation) • Composite power supply (faulty)	The intervals of the zero cross signal is outside the tolerance.
E710	• DC controller (faulty)	The IPC (Q104) cannot be initialized at power-on.
E711	• DC controller (faulty)	An IPC communication error has been detected twice within 1 sec.
E712	• DC controller (faulty) • DF controller (faulty) • Connector (poor contact)	An error in communication with the DF cannot be cleared.
E717	• DC controller (faulty) • ASSIST controller (faulty) • Communication (with ASSIST)	• A communication with ASSIST has been successfully but failed in the middle. • An open circuit is detected on the line with ASSIST.

Table 3-801-3

Clearing an Error Code (back-up data)

When the self diagnosis mechanism has been activated, the copier may be reset by turning its power off and on. However, this does not work for E000, E001, E002, E003, E004, or E007; this arrangement is to prevent the user from causally resetting any of the errors, which could damage the film or the heater in side the fixing assembly.

If E000, E001, E002, E003, E004, or E007 is indicated, remove the cause and clear the back-up data as follows:

1) Open the front door, and insert the door switch actuator.
2) Press the power switch while holding down the service mode switch (SW302) on the DC controller with a hex key.
3) The power should go off in about 2 sec; turn on the power.

Caution:
Detection of E000, E001, E002, E003, or E004 automatically turns off the copier. To check the type of error in service mode, go through the above steps after disconnecting the fixing heater.

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Self Diagnosis (ADF)

Code	Cause	Description
E400	• data communication with copier (error)	The data communication is monitored at all times; the error is identified if the communication with the copier is absent for 5 sec or more.
E402	• belt motor (fails to rotate) • belt motor clock sensor (faulty)	The belt clock pulses within 200 msec are below the specified number.
E404	• delivery motor (fails to rotate) • delivery motor clock sensor (faulty)	The delivery motor clock pulses within 200 msec are below the specified number.
E411	• document detection (faulty) • registration sensor (faulty) • document edge sensor (faulty)	The output of the sensor is 2.3 V or more in the absence of paper.

Note:
To reset the copier after activation of the self diagnosis mechanism, switch the copier off and then on. You can still continue to make copies even when the ADF is out of order; simply open the ADF, and set the documents on the copyboard glass.

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Self Diagnosis (sorter)

Code	Cause	Description
E500	The CPU or the communications IC on the sorter controller is not operating normally.	An error is detected in the communication between the sorter and the copier.
E510	The feeder motor fails to rotate.	The clock signal from the motor is off for 250 msec or more.
E530	The stapler guide bar swing motor fails to rotate.	The home position sensor does not turn off after generation of 2560 pulses of the motor drive signal.
E531	The stapler unit swing motor fails to rotate.	• The stapler unit swing sensor does not turn off within 500 msec after generation of the motor drive signal. • The sensor does not turn on again within 1000 msec after the stapler unit swing sensor has turned off.
E540	The bin shift motor fails to rotate.	• The reed cam home position sensor does not turn off within 2000 msec after generation of the motor drive signal. • The reed cam home position sensor does not turn on once again within 2000 msec after it has turned off.
E541	• Bin motor (faulty) • Reed cam drive gear (faulty mounting)	The reed cam position sensor does not turn on within 1.0 sec after it has turned off.

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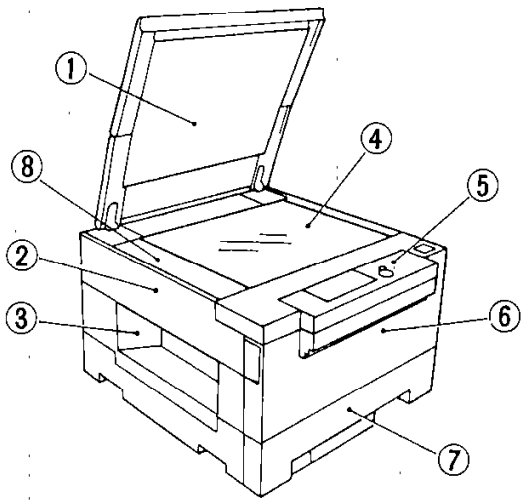
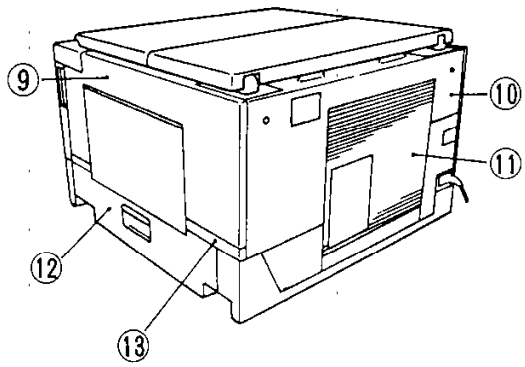
I. EXTERNALS

A. External Covers



① Copyboard cover
② Left cover
③ Delivery cover
④ Copyboard
⑤ Control panel
⑥ Front door
⑦ Cassette
⑧ Upper left cover

Figure 4-101



⑨ Right cover
⑩ Upper rear cover
⑪ Rear cover
⑫ Lower right cover
⑬ Lower right back

Figure 4-102 cover

Note:
Detach the covers when cleaning, inspecting, or repairing the inside of the copier as necessary.
Covers that may be detached merely by removing their respective mounting screws are omitted from the discussion.

Caution:
When attaching the rear cover, be sure that the harness is housed inside the upper rear cover so that its portion shown in the diagram will not spring out the cover or the harness will not come into contact with the connector plate.

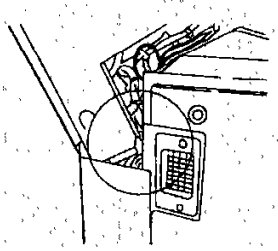


Figure 4-103

When attaching the copyboard glass, make sure that it is firmly in contact with the vertical size plate without a gap to prevent intrusion of foreign matter.

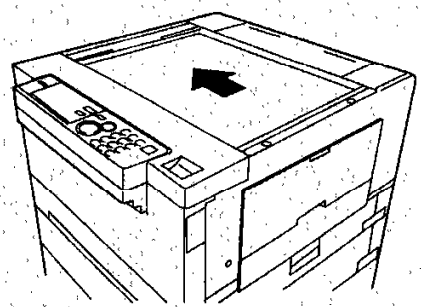


Figure 4-104

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B. Control Panel

1. Detaching the Control Panel

1) Detach the copyboard glass.
2) Detach the upper left cover.
3) Open the front door.
4) Pull the copier's open/close lever to open the copier.
5) Detach the upper rear cover.
6) Detach the right cover.
7) Detach the left cover.
8) Remove the five screws ①, and detach the inside cover ②.

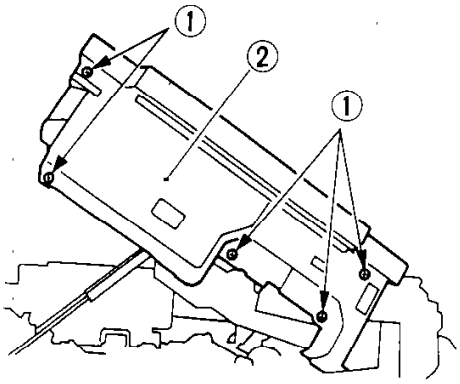

Figure 4-105

9) Disconnect the two connectors ④ (J309, J310) on the DC controller PCB; then, detach the control panel ⑤.

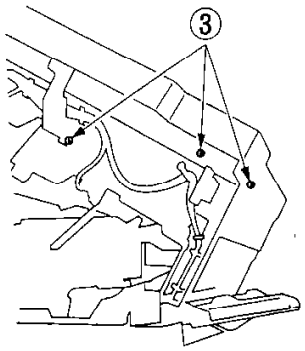

Figure 4-106

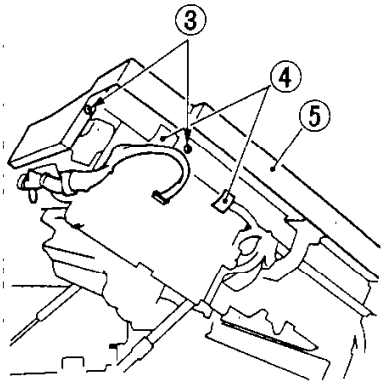

Figure 4-107

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C. Fans

1. Detaching the Exhaust Fan

1) Open the front door.
2) Pull the copier's open/close lever to open the copier.
3) Detach the DC controller PCB. (See "1. Detaching the DC Controller PCB" on p. 4-45.)
4) Remove the screw ① at the copier's rear, and remove the two screws ② at the front.

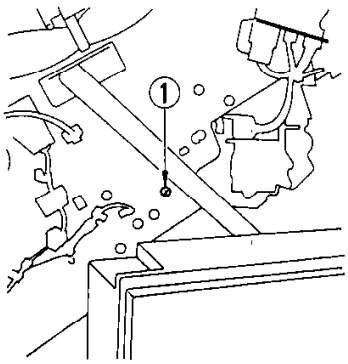

Figure 4-108

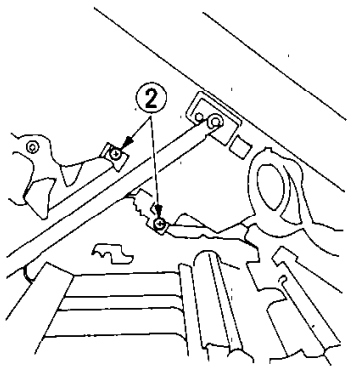

Figure 4-109

5) Pull out the exhaust fan assembly ③ toward the front while supporting it.

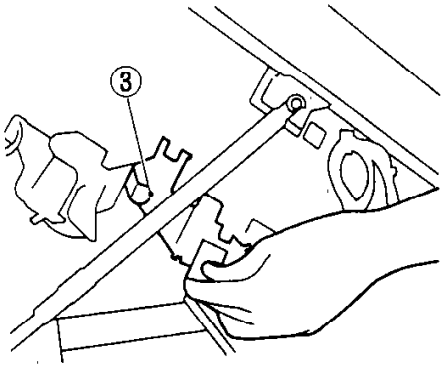

Figure 4-110

6) Remove the four screws ④, and detach the exhaust fan ⑤.

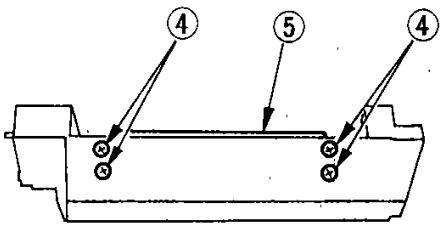

Figure 4-111

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II. DRIVE SYSTEM

A. Scanner Drive Assembly

1. Detaching the Scanner Drive Motor

1) Remove the upper rear cover.
2) Disconnect the connector ① of the motor, and remove the two screws ②; then, detach the scanner drive motor ③.

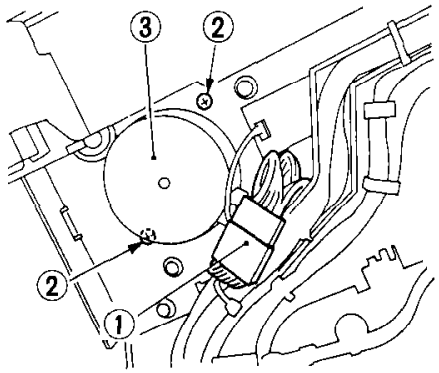

Figure 4-201

2. Detaching the Scanner Cable

1) Detach the copyboard cover, right cover, left cover, upper rear cover, and lower rear cover.
2) Detach the copyboard glass.
3) Detach the control panel.
4) Detach the copyboard cover support ①.

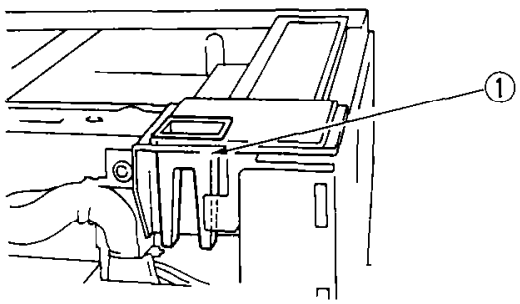

Figure 4-202

5) Remove the six screws ②, and detach the upper left stay ③.

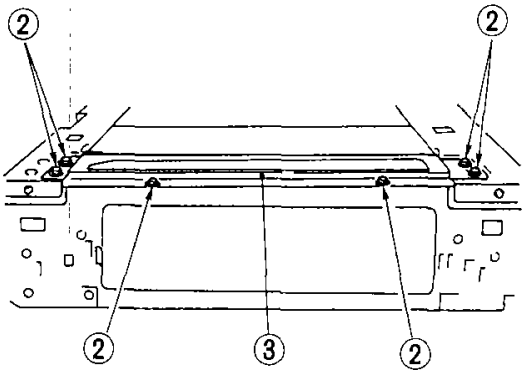

Figure 4-203

6) Fix the cable in place using a pully clip (FY9-3010)

Figure 4-204

7) Loosen the two screws ④ to loosen the cable tension (both front and right).

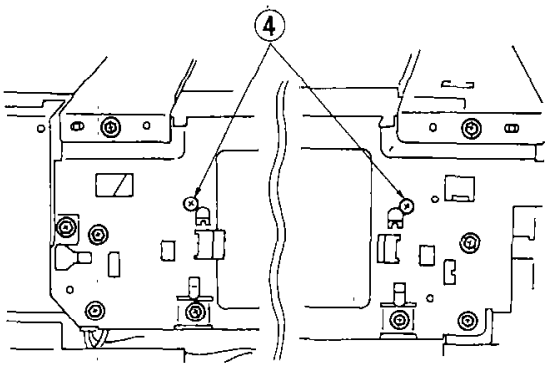

Figure 4-205

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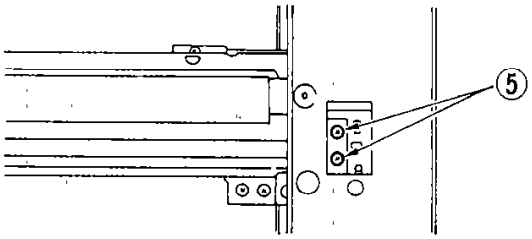
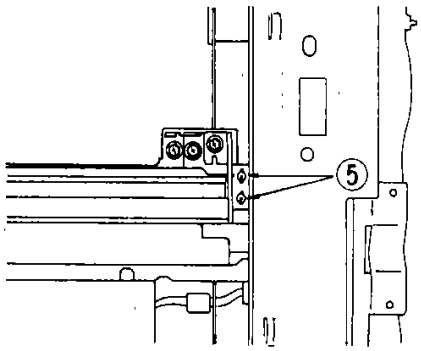
8) Move the No. 1 mirror mount to the front to align the long hole in the front side plate and the cable fixing screw ⑤.
Then, detach the cable fixing screw ⑤ to separate the No. 1 mirror mount and the scanner cable (both front and rear).



(front)



(rear)

Figure 4-206

9) Remove the pully clip, and detach the scanner cable (both front and rear).

3. Assembling the Mirror Position Tool

1) Remove the screw found in position B.

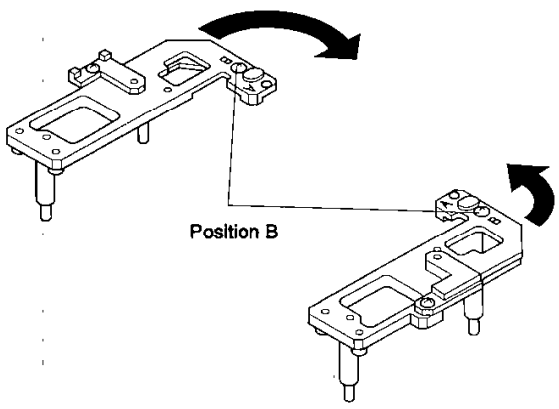


Figure 4-207

2) Fit the screw removed in step 1) in position A, and tighten it slightly.
3) Extend the arm accommodated by the main frame unit it butts against the stopper as in Figure 4-208.
4) Tighten the screw.

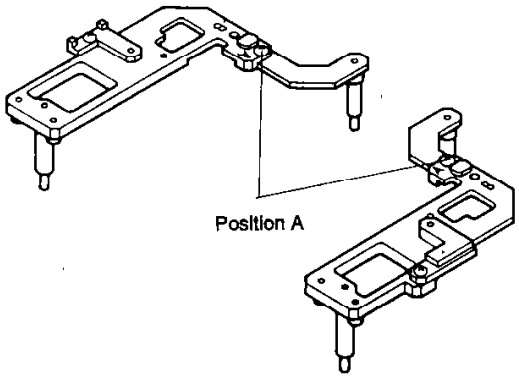


Figure 4-208

4. Routing the Scanner Cable

Keep the mirror positioning tool (FY9-3009) and pulley clip (FY9-3010) handy when routing the scanner cable.

Further, if you are using the mirror positioning tool, assemble it in advance by referring to "3. Assembling the Mirror Positioning Tool."

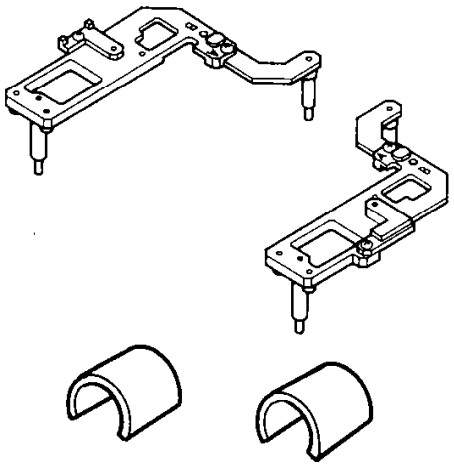


Figure 4-209

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1) Put the steel ball into the hole of the pulley, and wind the cable four times toward the flange and then nine times in the opposite direction; thereafter, fix it in place using the pulley clip.
2) As in ②, set the mirror positioning tool between the No. 1 and No. 2 mirror mounts.
3) Loosen the screw on the mirror pulley mount as in ③; then, temporarily fix the cable in position on the left stay.
4) Route the cable as shown in the illustration; engage ⑤ on the hook on the side plate, and engage the ⑧ on the tension plate on the lens mount.
5) Tighten the screw loosened in ③, and fix the cable to the left stay.
6) Loosen the screws on the drive pulley once so that the tension of the scanner cable is even as in ⑩; then, tighten it once again.
7) Fix the No. 1 mirror mount and the scanner cable fixing as in ⑪.
8) Make adjustments so that the length of the cable is 34 ±1 mm as in ⑨ using a ruler.

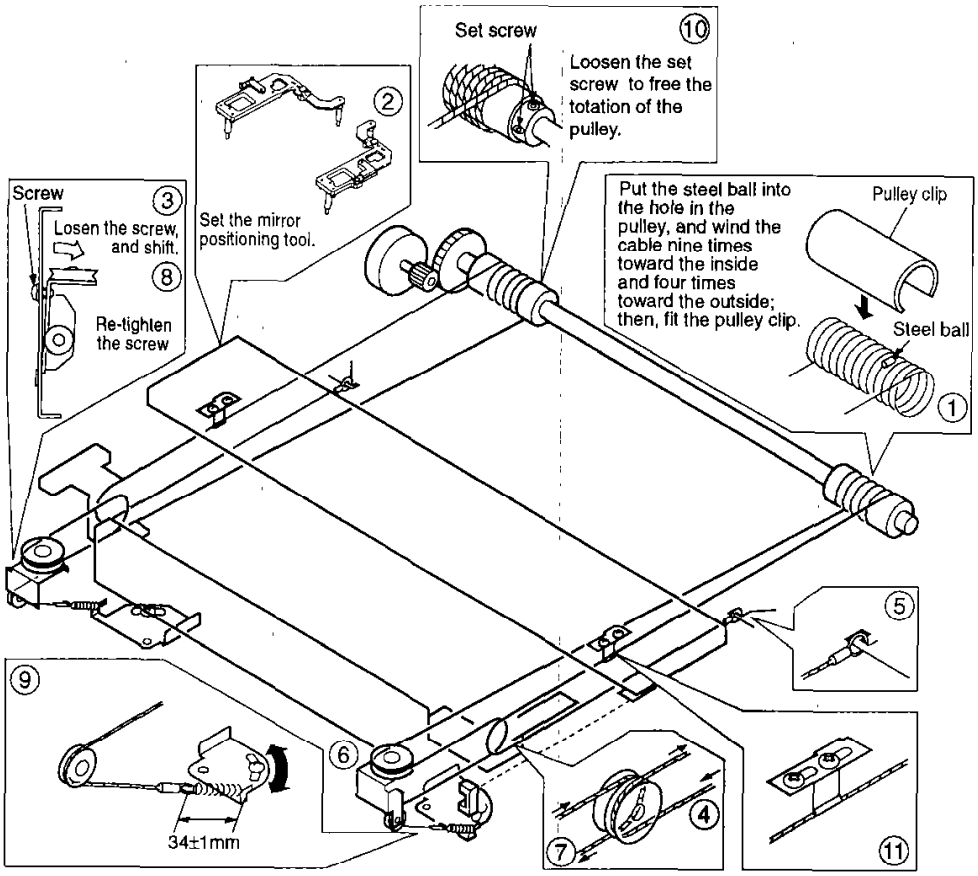

Figure 4-210

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Caution:
When attaching the wire spring, pay attention to the orientation of the spring; see the diagrams below. If not attached correctly, its hook tip could interfere with the cable.

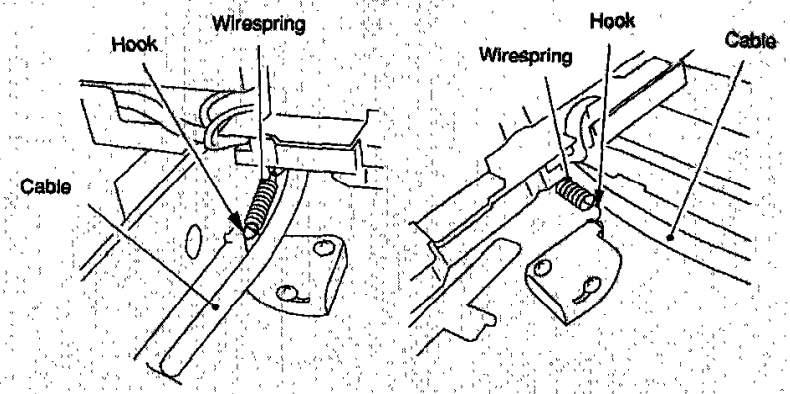

Figure 4-211

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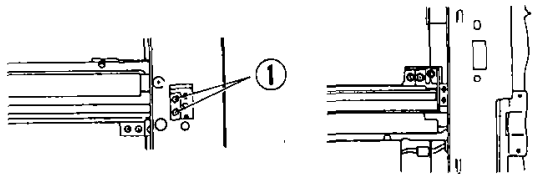
5. Adjusting the Position of the Mirrors (optical length of No. 1, 2, and 3 mirrors)

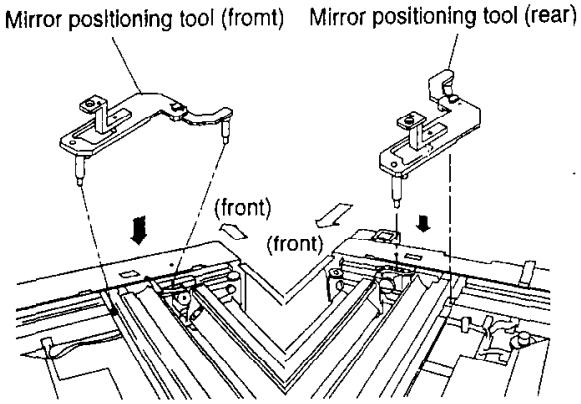
1) Keep the mirror positioning tool handy. (See "3. Assembling the Mirror Positioning Tool.")
2) Move the No. 1 mirror mount toward the front, and align the angular hole in the front side plate and the cable fixing screw ①.



(front) (rear)

Figure 4-212

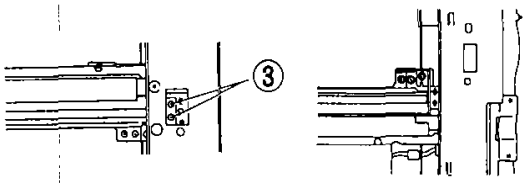
3) Loosen the set screw on the pulley.
4) Set the mirror positioning tool ② to the No. 1 mirror mount and the No. 2 mirror mount (both front and rear).



(front) (front)

Figure 4-213

5) Attach the scanner cable fixing to the No. 1 mirror mount using two screws ③ (both front and rear).
6) Tighten the screw on the pulley.
7) Detach the tool (FY9-3009).



(front) (rear)

Figure 4-214

6. Cleaning the Scanner No. 6 Mirror

1) Open the front cover.
2) Open the copier by operating the copier open/close lever.
3) Detach the dust-proofing glass ① and dust-proof mirror cover ②.

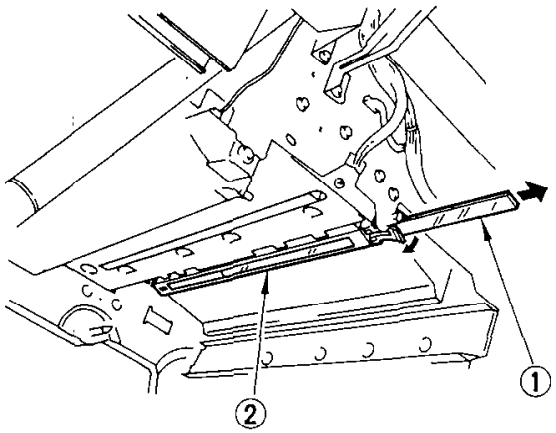


Figure 4-215

4) Clean the No. 6 mirror using a blower brush or lint-free paper moistened with alcohol.

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B. Lens Drive Assembly

1. Detaching the Lens Drive Motor

1) Detach the upper rear cover and right glass rerainer.
2) Detach the copyboard glass.
3) Move the No. 1 mirror assembly ① to the left.
4) Remove the two screws ②, and detach the lens cover ③.

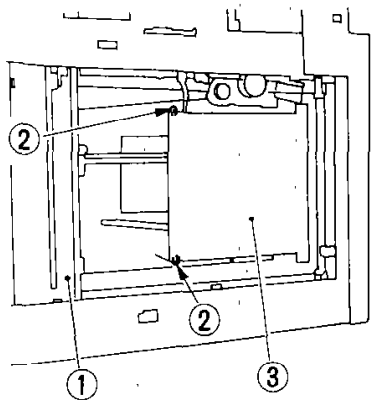

Figure 4-216

5) Loosen the tension on the spring ④, and detach the cable ⑤.

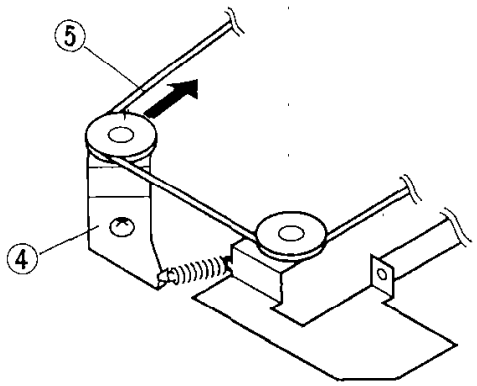

Figure 4-217

6) Disconnect the two connectors ⑥ from the copier's rear.

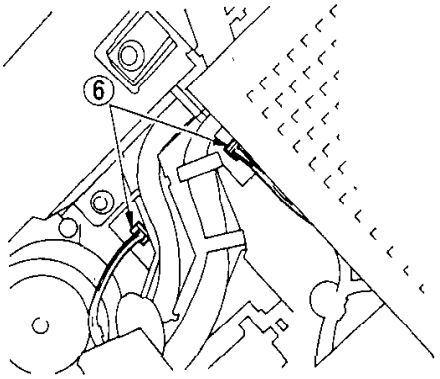

Figure 4-218

7) Remove the two screws ⑦, and detach the lens drive unit ⑧.

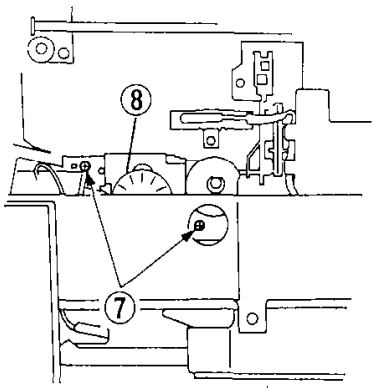

Figure 4-219

8) Remove the two screws, and disconnect the connector ⑩; then, detach the lens motor ⑪.

Caution:
Disconnect the connector ⑩ first before removing the screw ⑨; otherwise, the harness and driver will come into contact with each other.

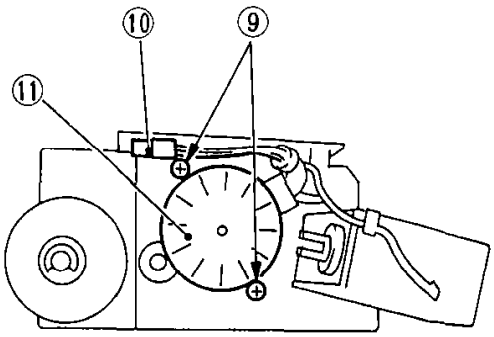

Figure 4-220

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2. Routing the Lens Cable

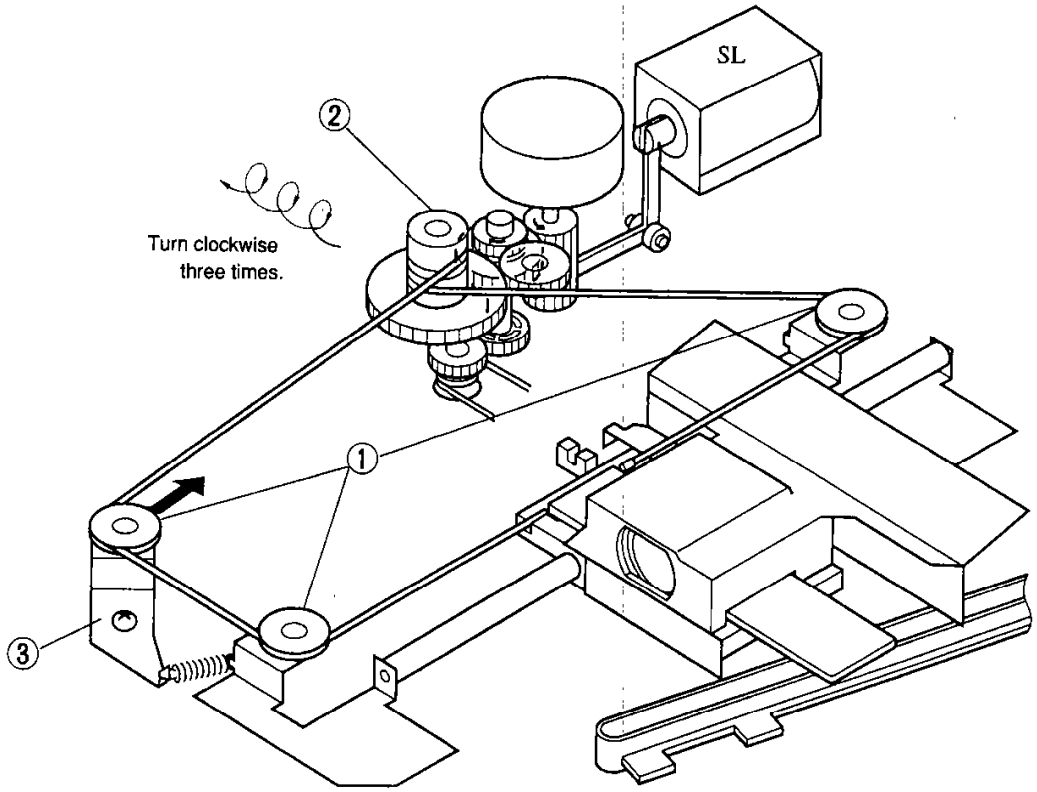

Figure 4-221 Lens Drive Assembly

1) Attach the lens cable to each pulley ① while winding it around the lens pulley ② as indicated in Figure 4-221.
2) Move the tension pulley ③ to hook the cable.

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3. Adjusting the Position of the Change Solenoid

Make adjustments by loosening the two screws ⑤ so that the gear ④ is moved fully in the direction of b by the arm ③ when the steel core ① of the solenoid is fully pushed in the direction of B by a finger, i.e., when the E-ring ② comes into contact with the solenoid.

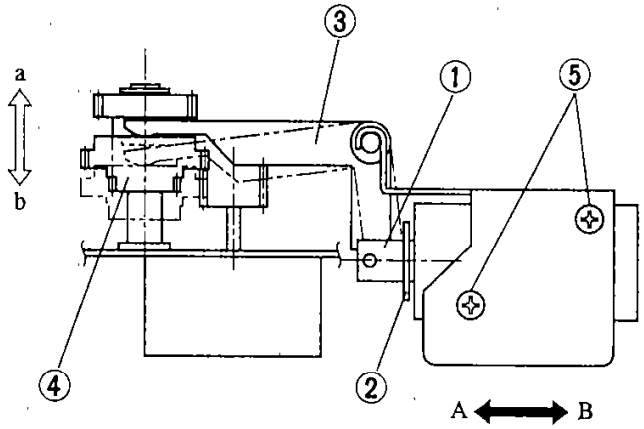

Figure 4-222

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C. Main Motor/Main Drive Assembly

1. Detaching the Main Motor Unit

1) Detach the rear cover.
2) Disconnect the two connectors ①, and remove the three screws ②; then, detach the main motor unit ③.

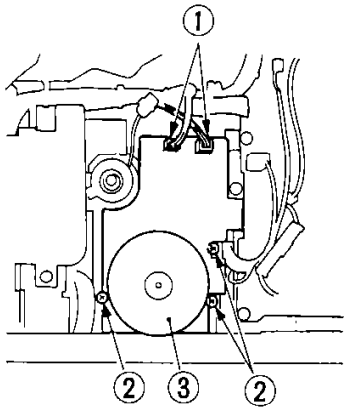

Figure 4-223

2. Detaching the Main Drive Assembly

1) Open the front door.
2) Pull out the drum cartridge.
3) Detach the multifeeder unit.
4) Detach the rear cover.
5) Detach the main motor.
6) Remove the clip ring ①, and disconnect the connector ②; then, detach the registration clutch ③.

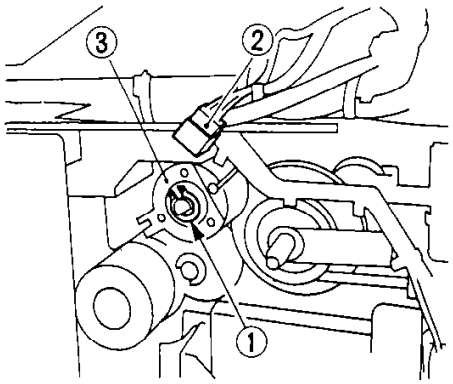

Figure 4-224

7) Remove the screw ④, and detach the composite power supply support plate ⑤.

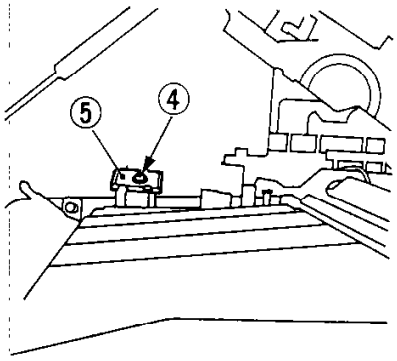

Figure 4-225

8) Detach the belt from the belt tensioner ⑥ of the fixing drive assembly.

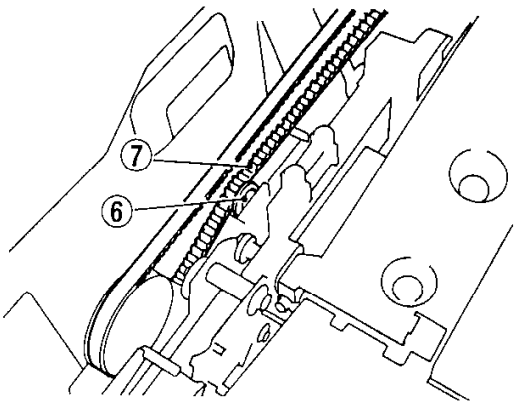

Figure 4-226

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9) Turn the pulley ⑧ clockwise, and detach the belt ⑨.

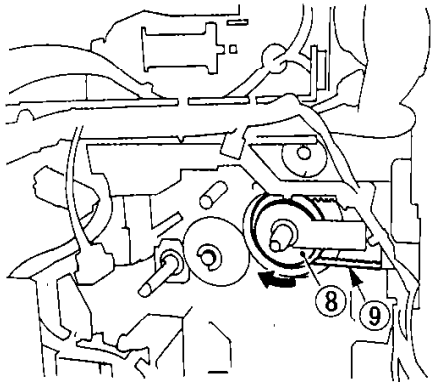

Figure 4-227

10) Remove the E-ring ⑩ and clip ring ⑪; then, detach the bushing ⑫. In this condition, detach the gear and pulley ⑬ from the main drive assembly.

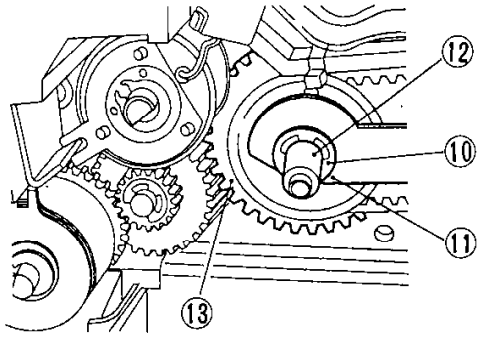

Figure 4-228

3. Routing the Drive Belt

Route the drive belt attaching them to the pulley and the tensioner as shown in Figure 4-229.

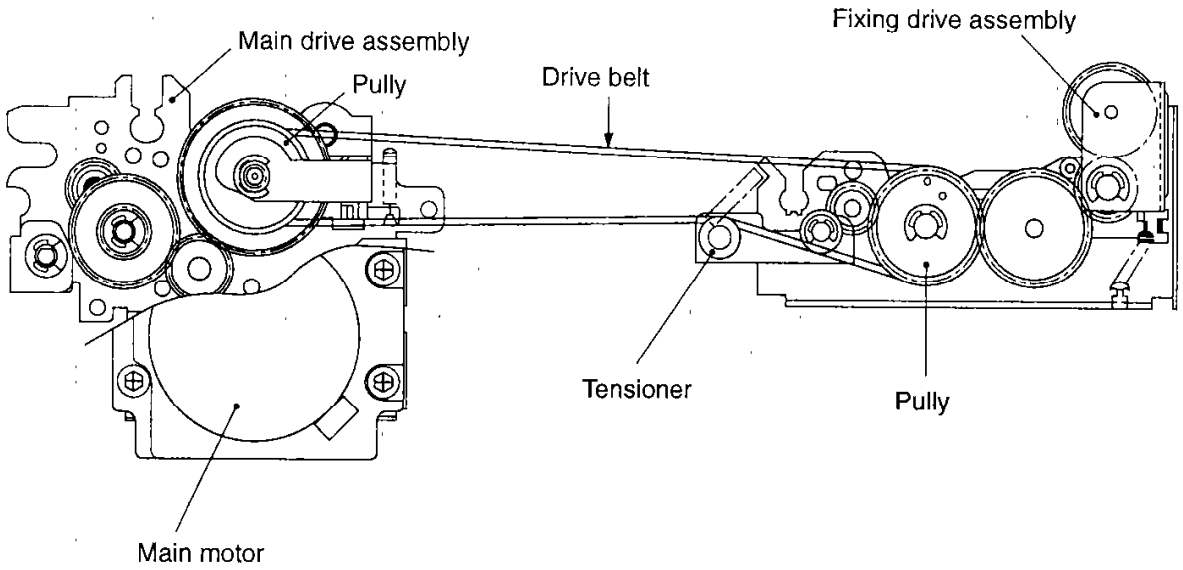

Figure 4-229

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III. PICK-UP/FEEDING SYSTEM

A. Pick-Up Assembly

1. Detaching the Pick-Up Roller Unit

1) Pull out the cassette.
2) Remove the stop ring ① (plastic) from the front of the pick-up roller unit.

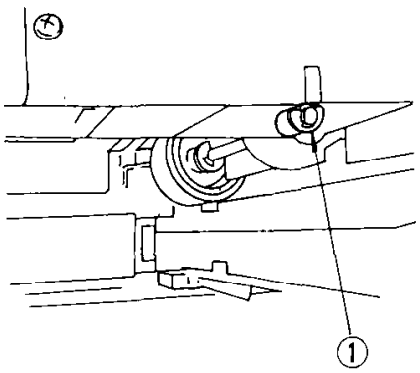

Figure 4-301

3) Open the lower right cover.
4) Remove the two screws ②, and pull out the paper guide plate toward the front.

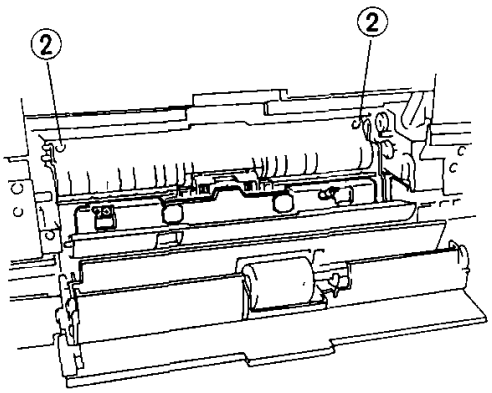

Figure 4-302

Note:
You will have sufficient access to the pick-up roller and the bushing at the rear in this condition.

5) Push in the pick-up roller ③ from the direction of step 4) toward the rear, and remove the bushing ④ while lowering it to the lower left.

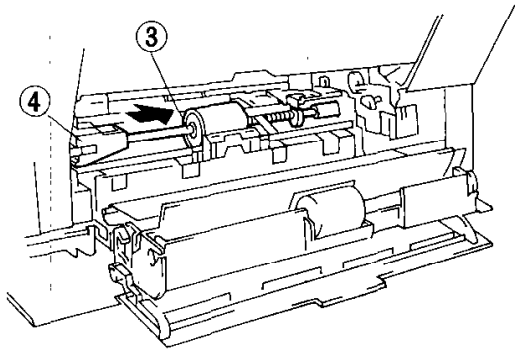

Figure 4-303

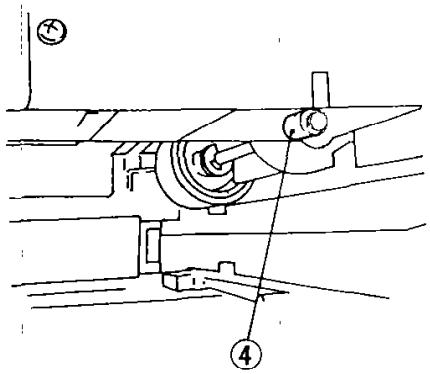

Figure 4-304

6) Push in the bushing ⑤ at the rear toward the front, and lower the spring pressure to remove the pick-up unit toward the left of the copier.

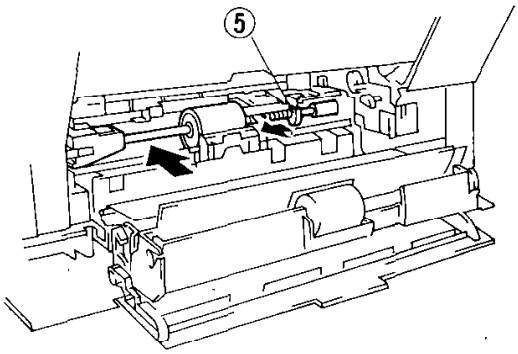

Figure 4-305

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Note:
When removing the pick-up roller Assembly, separate the right side black bushing from the key.

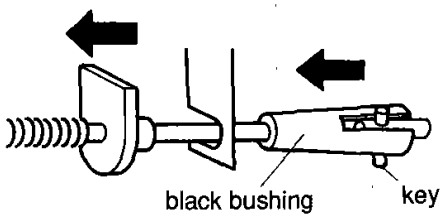

Figure 4-306

Caution:
Check that the paper registration sensor (PS 6) is properly seated after this procedure is completed.

2. Detaching the Pick-Up Roller

1) Detach the pick-up roller unit. (See "1. Detaching the Pick-Up Roller Unit.")
2) Remove the E-ring ① and the E-ring ②; then, pull out the pick-up roller ③ together with the collar.

Caution:
Take care not to drop the pin found toward the rear.

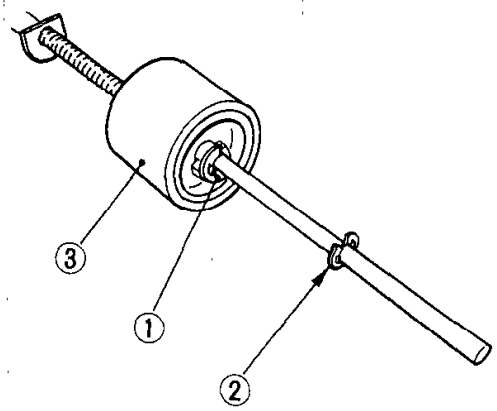

Figure 4-307

3. Points to Note When Attaching the Pick-Up Roller

When attaching the pick-up roller ①, attach it so that the side ② shown in Figure 4-308 is toward the rear.

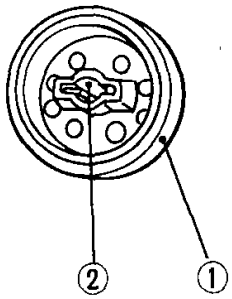

Figure 4-308

4. Detaching the Pick-Up Clutch

1) Detach the main motor unit. (See "1. Detaching the Main Motor Unit" on p. 4-12.)
2) Remove the two screws ①, and detach the connector mount ②.

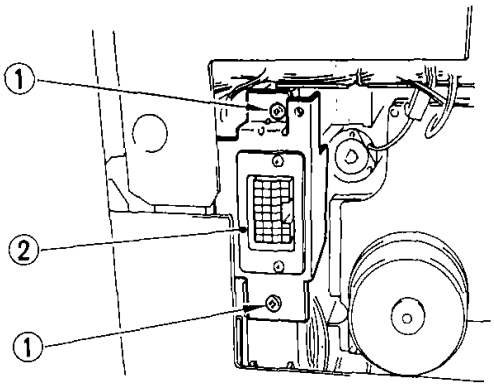

Figure 4-309

3) Disconnect the connector ③, and remove the clip ring ④; then, detach the pick-up clutch ⑤.

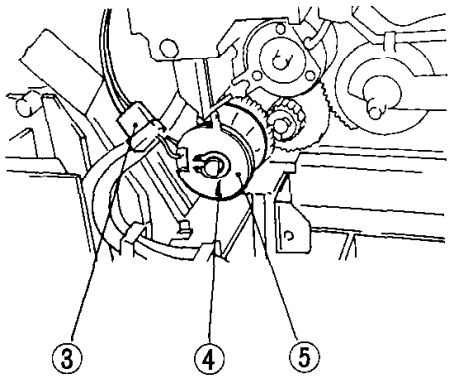

Figure 4-310

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5. Detaching the Separation Pad

1) Open the right door.
2) Remove the two screws ①, and detach the separation cover ②.

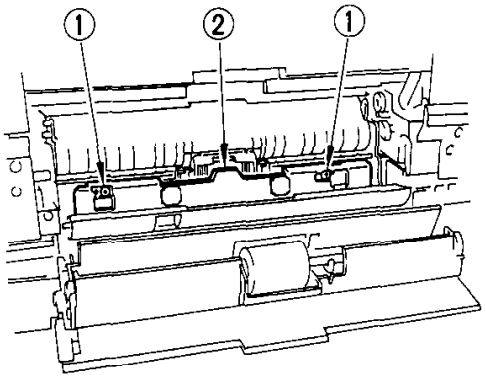

Figure 4-311

3) Remove the two screws ③, and detach the separation pad unit ④.

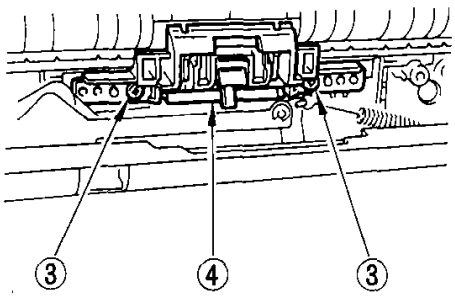

Figure 4-312

6. Adjusting the Left/Right Registration

Make adjustments so that the position of the image is as shown in Figure 4-314 when the Test Sheet is copied in Direct.

a. Pick-Up from the Cassette

Turn the screw ① shown in Figure 4-313 to adjust the position of the cassette hook plate.

standard: 0 ±1.5 mm

clockwise turn: moves the paper in the direction of – shown in Figure 4-314

counterclockwise turn: moves the paper in the direction of + shown in Figure 4-314

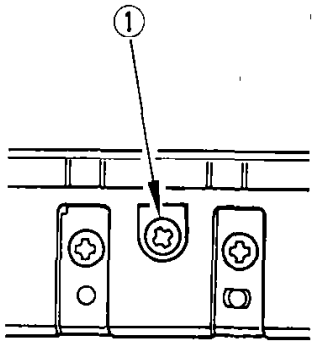

Figure 4-313

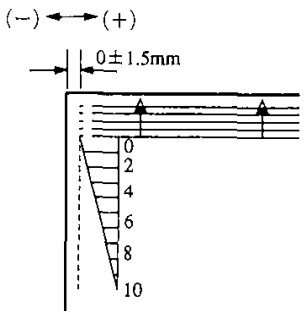

Figure 4-314

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B. Multifeeder Assembly

1. Detaching the Multifeeder Assembly

1) Open the right door.
2) Remove the two screws ①, and shift the multifeeder assembly ② toward the front to detach.

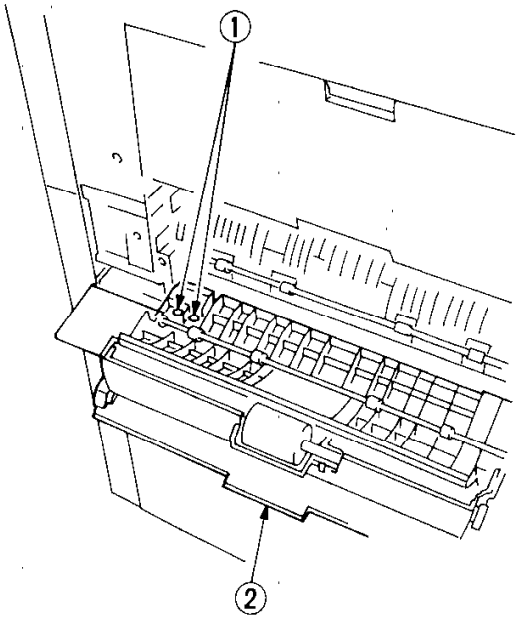

Figure 4-315

2. Detaching the Multifeeder Pick-Up Roller Unit

1) Open the right door.
2) Remove the E-ring ①, and pull out the bushing ②.
3) Remove the two screws ③.

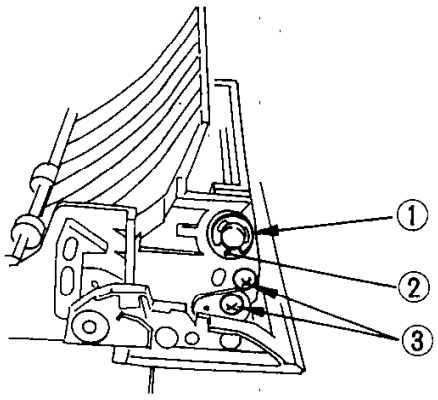

Figure 4-316

4) Remove the screw ④, and detach the roller cover ⑤.

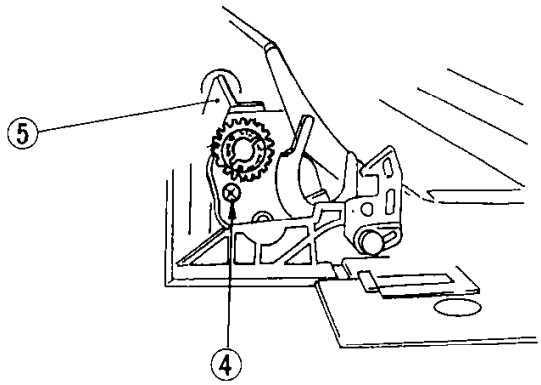

Figure 4-317

5) Shift the multifeeder pick-up roller unit ⑥ toward the rear to detach.

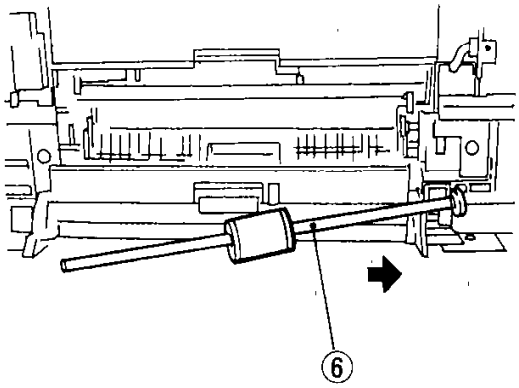

Figure 4-318

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3. Detaching the Multifeeder Pick-Up Roller

1) Detach the multifeeder pick-up roller unit. (See "2. Detaching the Multifeeder Pick-Up Roller Unit on p. 4-17.")
2) Remove the stop ring ① (plastic), and pull out the pick-up roller ② together with the collar.

Caution:
Take care not to drop the pin found at the rear.

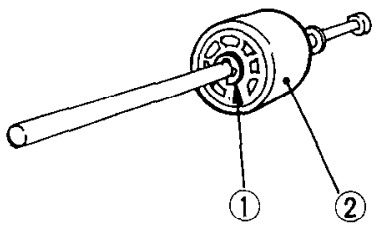

Figure 4-319

4. Points to Keep Note When Attaching the Multifeeder Pick-Up Roller

When attaching the multifeeder pick-up roller ①, make sure that the side with a cross ② on the collar is toward the rear.

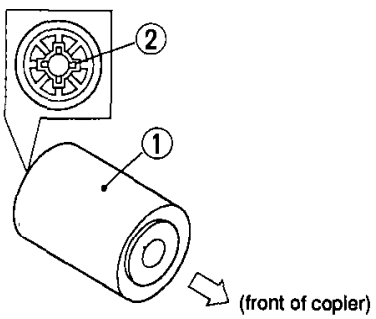

Figure 4-320

5. Detaching the Separation Pad

1) Open the upper right door.
2) Remove the two screws ①, and detach the separation pad ②.

Caution:
At this time, take care not to lose the spring on the separation pad assembly.

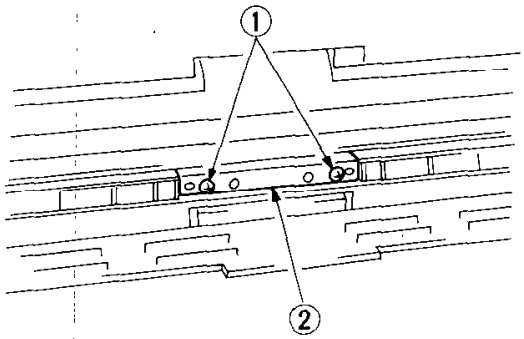

Figure 4-321

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6. Detaching the Multifeeder Drive Unit

1) Detach the multifeeder assembly. (See "1. Detaching the Multifeeder Assembly on p. 4-17.")
2) Detach the connector mount.
3) Remove the screw ①.

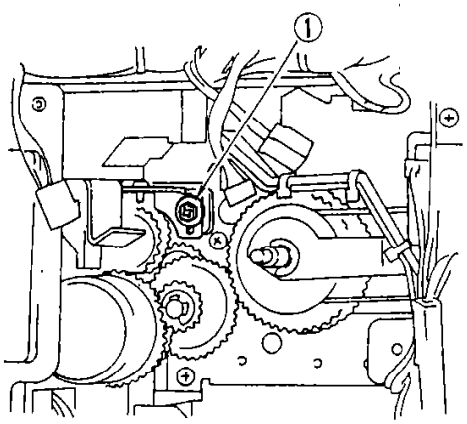

Figure 4-322

4) Remove the screw ②, and disconnect the connector ③; then, detach the multifeeder drive unit ④.

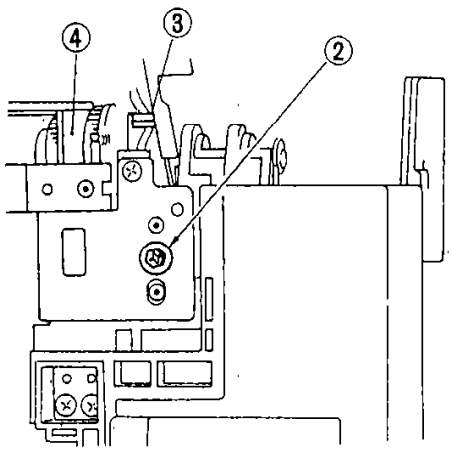

Figure 4-323

7. Detaching the Multifeeder Clutch

1) Detach the multifeeder drive unit. (See "6. Multifeeder drive Unit on p. 4-19.")
2) Remove the E-rings ① ② and screws ③ ④ ⑤; then, detach the support mount.
3) Detach the multifeeder pick-up clutch ⑥.

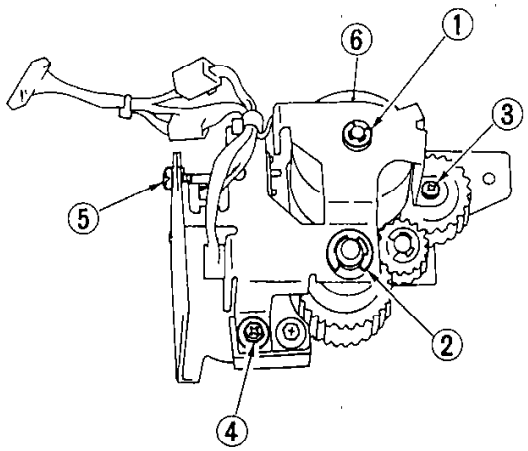

Figure 4-324

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8. Positioning the Multifeeder Assembly (paper guide plate cam)

Temporarily fix the screw equipped with a hex nut on the spring clutch assembly, and rotate the control ring. Make adjustments so that the hole in the cam and the hole in the multifeeder drive unit match as shown in Figure 4-325 when the claw is engaged with the solenoid plate; then, fix in position.

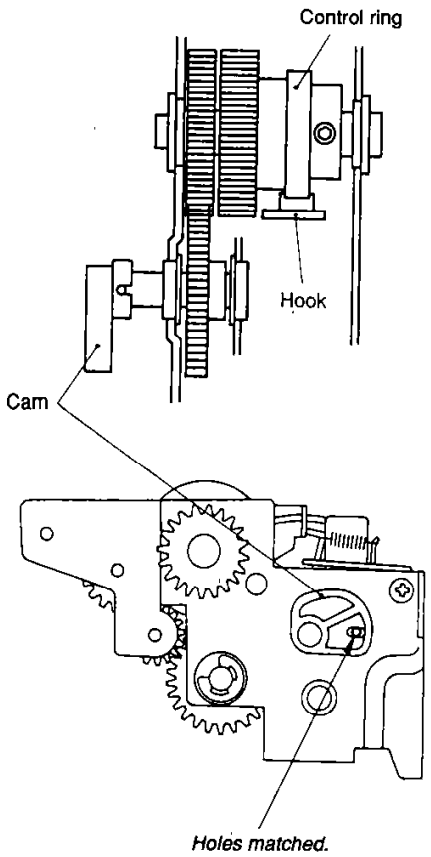

Figure 4-325

9. Adjusting the Left/Right Registration

If the right/left registration is not correct when copies are made using the multifeeder, loosen the screw ①, and adjust the position of the tray.

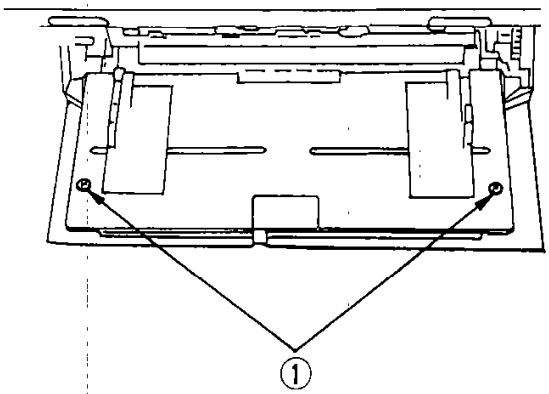

Figure 4-326

10. Points to Note When Attaching the Multifeeder Assembly Rack Plate

Attach the rack plate of the multifeeder to the pulley while both its right and left are fully open.

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C. Registration Roller Assembly

1. Detaching the Registration Clutch

1) Detach the connector cover or the lattice connector
2) Remove the clip ring ①, and disconnect the connector ②; then, detach the registration clutch ③.

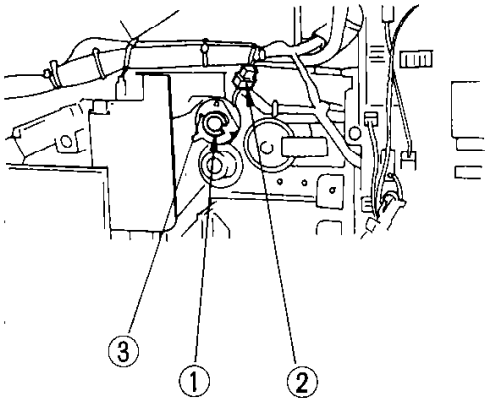

Figure 4-327

2. Detaching the Upper Registration Roller

1) Detach the registration clutch. (See "1. Detaching the Registration Clutch.")
2) Remove the spring ① (front) and spring ② (rear).

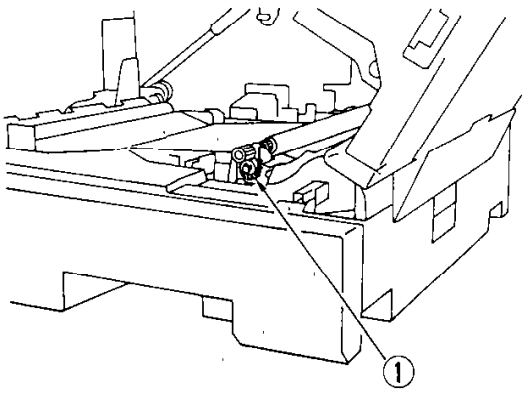

Figure 4-328

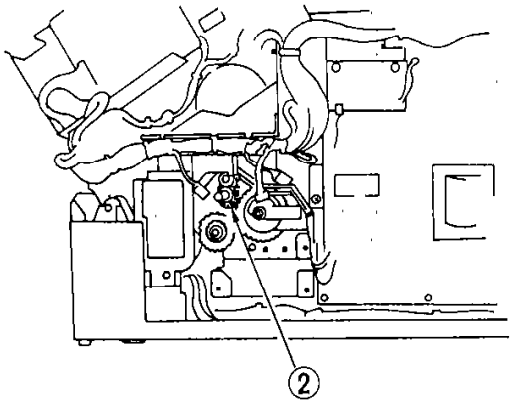

Figure 4-329

Caution:
Take care not to misplace the springs (front, rear).

3) Lift the upper registration roller ③ to detach.

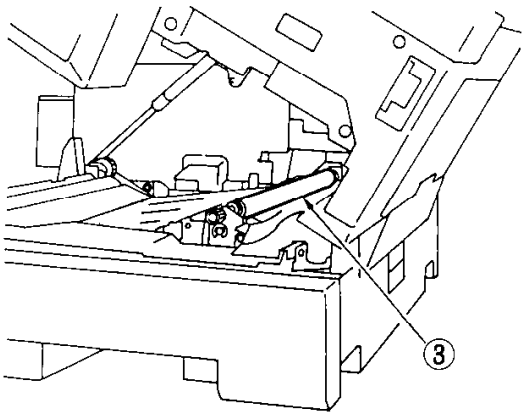

Figure 4-330

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3. Detaching the Lower Registration Roller

1) Detach the upper registration roller. (See "2. Detaching the Upper Registration Roller on p. 4-21.")
2) Open the lower right door, and remove the two screws ① to shift the pick-up guide ② toward the right side of the copier.

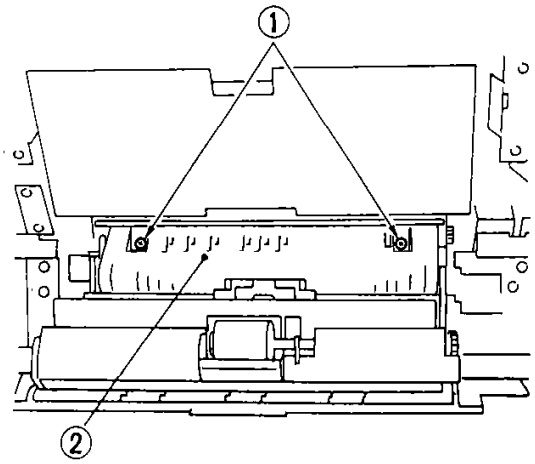

Figure 4-331

3) Remove the E-ring ③ (front), and shift the bushing ④.
4) Detach the registration roller ⑤.

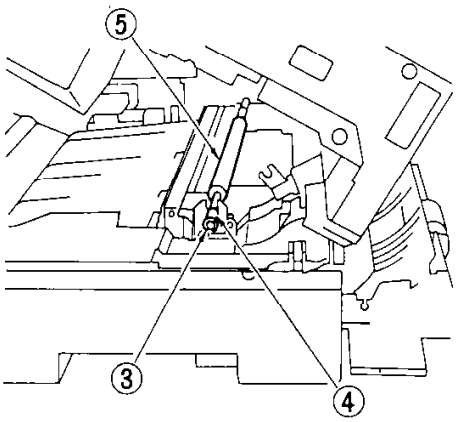

Figure 4-332

D. Feeding Assembly

Be sure to detach the cartridge before detaching the feeding assembly.

1. Detaching the Feeding Belt

1) Detach the lower fixing unit. (See "8. Detaching the Lower Fixing Unit" on p. 4-43.)
2) Remove the three screws ①, and shift the feeding retention plate ②.

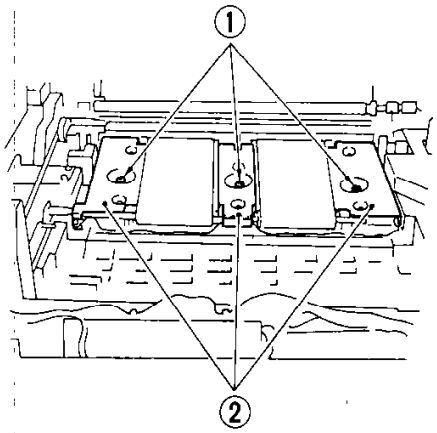

Figure 4-333

3) Disconnect the connector ③, and shift the feeding retention plate ②.

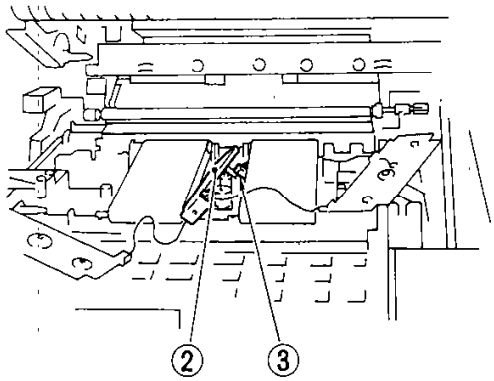

Figure 4-334

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4) Detach the feeding spacer ④ by pulling it toward the fixing assembly.

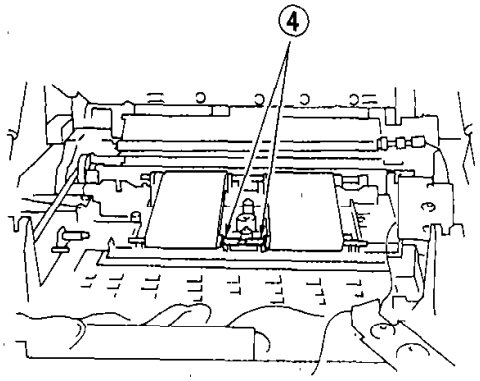

Figure 4-335

5) Detach the static eliminator.
6) Detach the feeding spacer ⑤ from the hook (arrow).

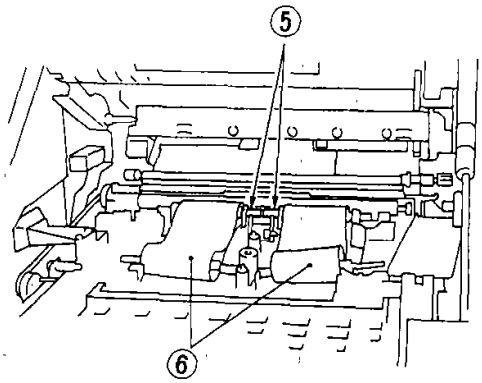

Figure 4-336

Caution:
Take care not to touch the transfer roller. Do not damage the area where the feeding spacers are in contact.

E. Delivery Assembly

1. Detaching the Delivery Roller

1) Open the copier's top body.
2) Remove the E-ring ①.
3) Shift the bushing ② (rear) and bushing ③ (front); then, detach the delivery roller ④.

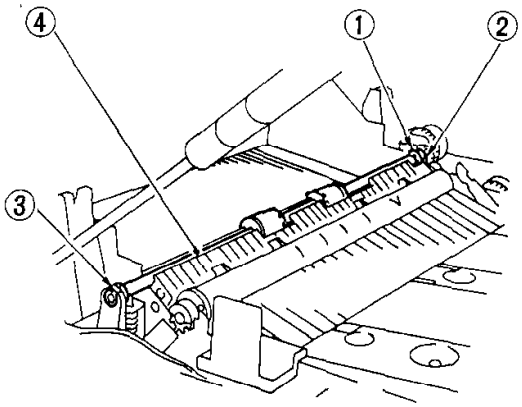

Figure 4-337

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F. Cassette Unit

1. Detaching the Copier from the Cassette Unit

1) Disconnect the copier's power plug.
2) Disconnect the connector ① of the cassette unit.

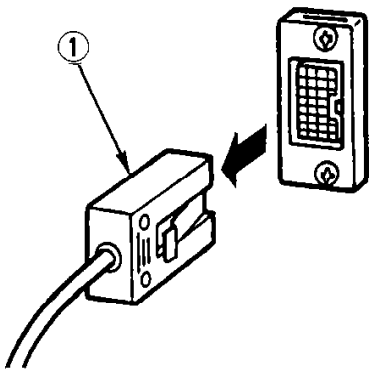

Figure 4-338

3) Hold the copier's grips, and detach the copier from the cassette unit.

2. Detaching/Attaching the Pick-Up Roller

See "2. Detaching the Pick-Up Roller" and "3. Points to Note When Attaching the Pick-Up Roller."

3. Detaching the Pick-Up Drive Unit

1) Detach the rear cover and right cover.
2) Remove the screw ①.

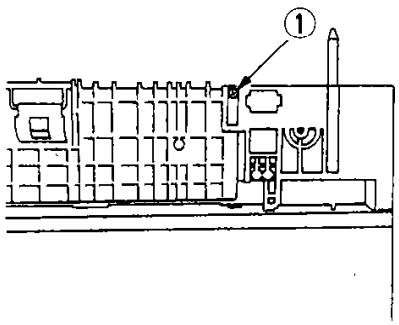

Figure 4-339

3) Remove the screw ②, and detach the harness guide ③.

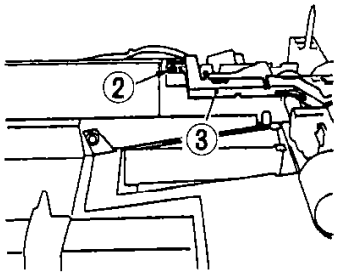

Figure 4-340

4) Remove the four screws ④, and disconnect the two connectors ⑤; then, detach the pick-up drive unit ⑥.

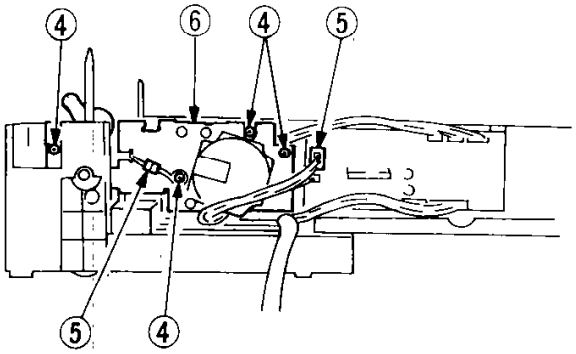

Figure 4-341

4. Detaching the Cassette Motor

1) Detach the rear cover.
2) Remove the two screws ①, and disconnect the connector ② (J114); then, detach the motor ③.

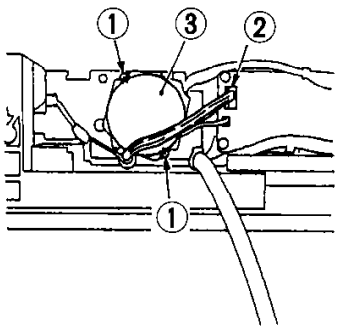

Figure 4-342

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5. Detaching the Pick-Up Clutch

1) Detach the pick-up drive unit. (See "3. Detaching the Pick-Up Drive Unit.")
2) Detach the cassette motor. (See "4. Detaching the Cassette Motor.")
3) Remove the three screws ①, and detach the bushing ② and side plate ③; then, detach the pick-up clutch ④.

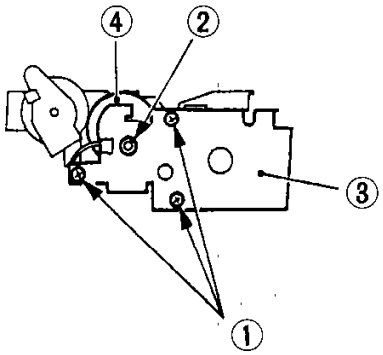

Figure 4-343

6. Detaching the Cassette Driver PCB

1) Detach the rear cover.
2) Disconnect all connectors from the cassette driver PCB ①.
3) Remove the three screws ②, and detach the driver PCB ①.

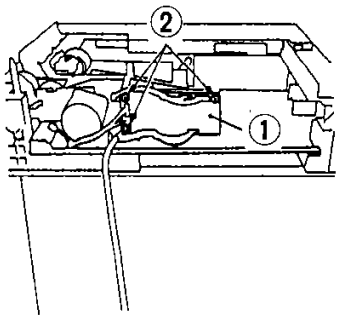

Figure 4-344

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IV. EXPOSURE SYSTEM

A. Illumination Assembly

1. Detaching the Scanning Lamp/ Fluorescent Lamp Heater

1) Disconnect the power plug.
2) Detach the copyboard glass.
3) Detach the upper rear cover.
4) Move the scanner unit near the center.
5) Remove the two screws ①, and detach the light-blocking plate ②.

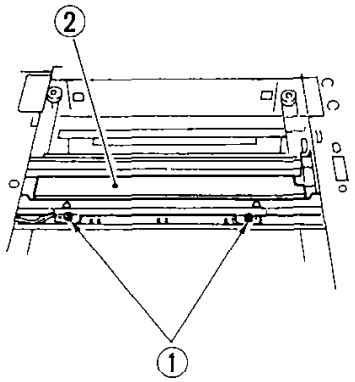

Figure 4-401

6) Disconnect the connectors ③, ④.

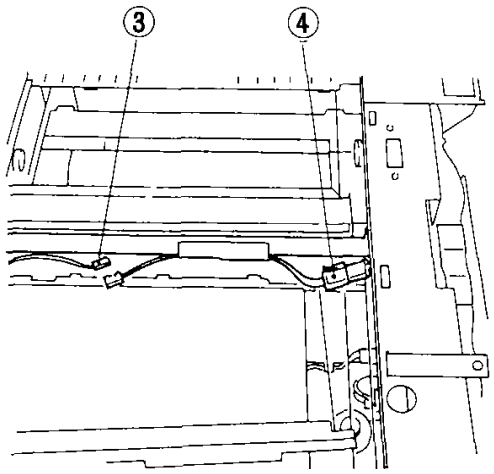

Figure 4-402

7) Remove the screw ⑤, and disconnect the connector ⑥.
8) Pull the fluorescent lamp ⑦ slowly toward the front to detach.

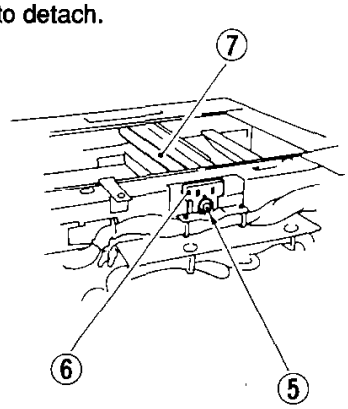

Figure 4-403

Caution:
Do not touch the fluorescent lamp. (Use lint-free paper.)

9) Detach the fluorescent lamp heater ⑧ from the fluorescent lamp.

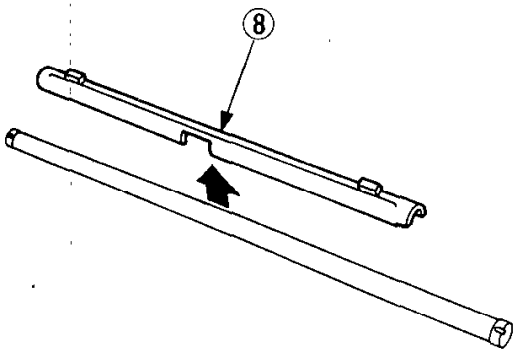

Figure 4-404

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2. Points to Note When Attaching the Fluorescent Lamp Heater/Scanning Lamp

- Attach the heater to the lamp as follows:

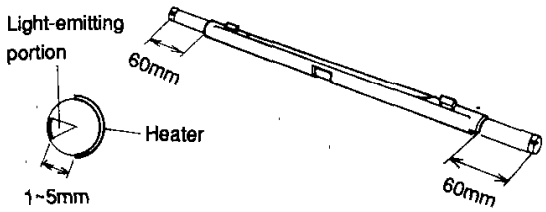

Figure 4-405

Caution:
Do not touch the fluorescent lamp. (Use lint-free paper.)
Do not block the light-emitting portion by the fluorescent lamp heater.

Attach the scanning lamp so that its light-emitting portion (open side) is to the left when viewed from the front of the copier as shown in Figure 4-406.

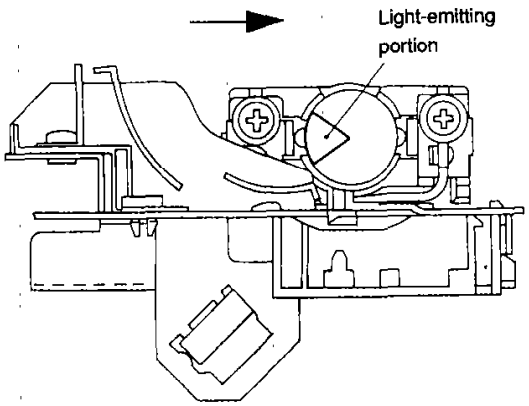

Figure 4-406 (front view)

Caution:
Do not touch the fluorescent lamp. (USe rint-free paper)
Be sure to adjust the gain and AE whenever you have replaced the fluorescent lamp. (See p. 3-84.)

- Make sure that the cut-off of the fluorescent heater is correctly oriented in relation to the intensity adjustment sensor.

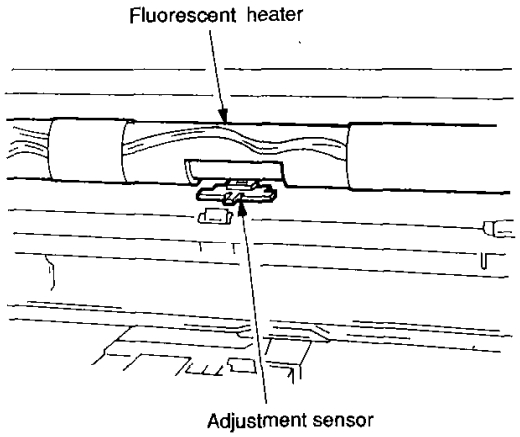

Figure 4-407

Reference:
The fluorescent lamp heater will not operate unless the copier's heater switch is turned on.

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3. Detaching the Blank Exposure Assembly

1) Open the front cover.
2) Pull the copier's open/close lever to open the copier.
3) Detach the inside cover.
4) Detach the exhaust fan and Drum cartridge. (See "Detaching the Exhaust Fan".)
5) Disconnect the connector ① (J315) on the DC controller PCB, and remove the two screws ②.

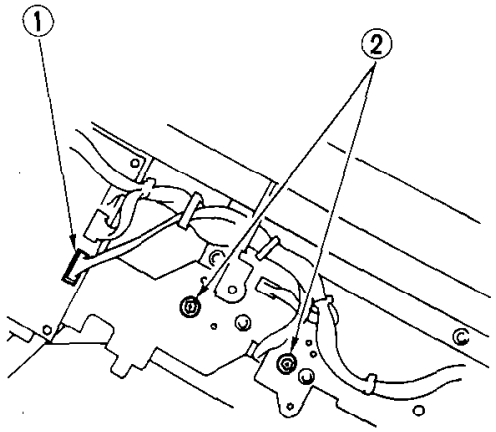

Figure 4-408

6) Push up the blank exposure assembly ③ lightly upward, and pull it out toward the bottom front.

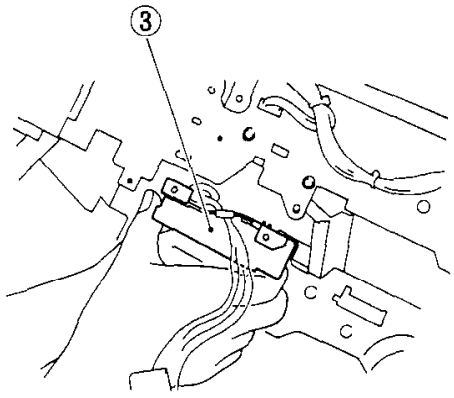

Figure 4-409

4. Detaching the Blank Exposure Lamp

1) Detach the blank exposure assembly. (See "4. Detaching the Blank Exposure Assembly.")
2) Remove the four screws ①, and disconnect the connector ②.

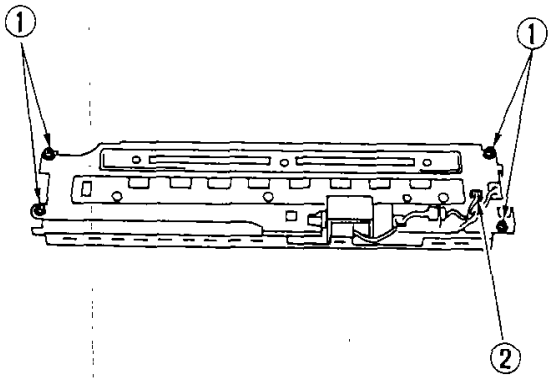

Figure 4-410

3) Disconnect the connector ③.

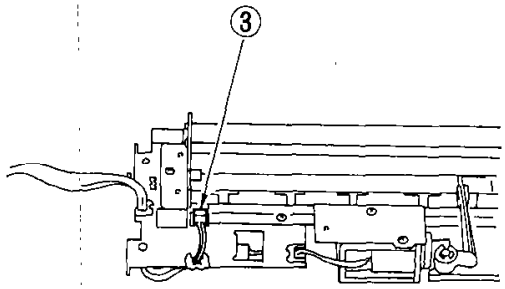

Figure 4-411

4) Remove the three screws ④, and detach the blank exposure lamp ⑤.

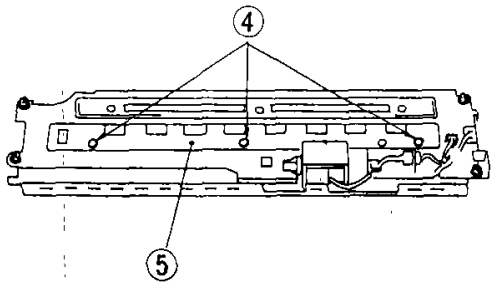

Figure 4-412

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5. Detaching the Blank Shutter Solenoid

1) Detach the blank exposure assembly.
2) Detach the blank shutter upper plate, and disconnect the connector ①. (See "4. Detaching the Blank Exposure Assembly.")
3) Remove the E-ring ②, and detach the link arm ③ from the blank shutter.
4) Remove the two screws ④, and pull out the blank shutter solenoid.

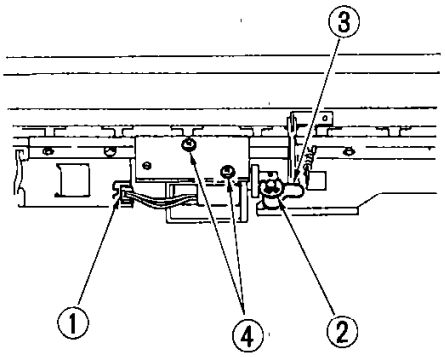

Figure 4-413

6. Positioning the Blank Shutter Solenoid

Adjust the position of the solenoid so that the bottom A is 7.7 ±0.5 mm on both sides of the shutter when the solenoid is moved in the direction of activation. When taking measurements, do not push down the shutter.

After adjustments, make sure that the solenoid moves smoothly.

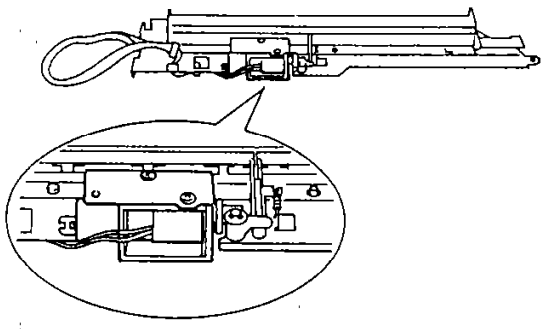

Figure 4-414ⓐ

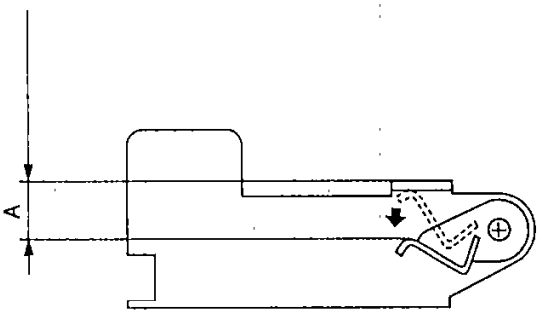

Figure 4-414ⓑ

7. Routing the Blanking Cable

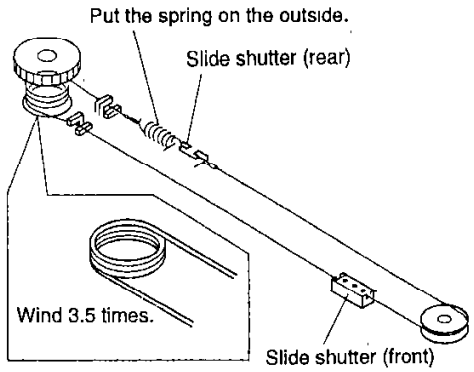

Figure 4-415

8. Positioning the Left/Right Margin

Turn the blanking shutter adjusting screw on the copier's front side plate shown in Figure 4-416 so that the standards are met.

①	clockwise turn	moves the margin to the front.
②	counterclockwise turn	moves the margin to the rear.
③	a full turn	moves about 1 mm.

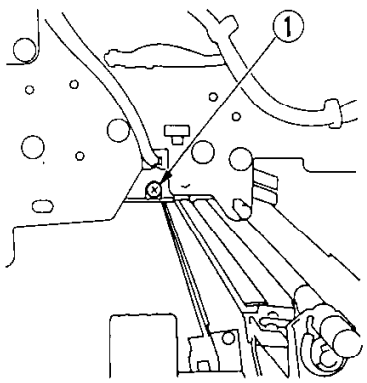

Figure 4-416

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V. CORONA SYSTEM

A. Drum Unit

1. Detaching the Drum Unit

1) Open the front door.
2) Pull out the developing assembly releasing lever ① toward the front, and turn it clockwise.

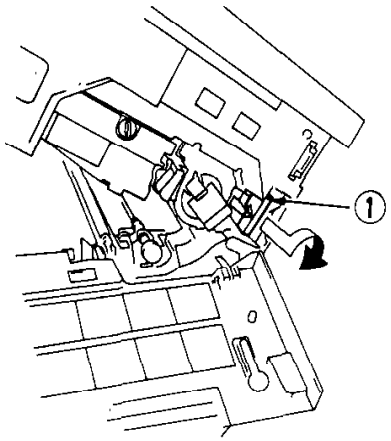

Figure 4-501

3) Open the copier's top unit.
4) Turn the knob ② counterclockwise to detach.
5) Pull out the drum unit ③ toward the front.

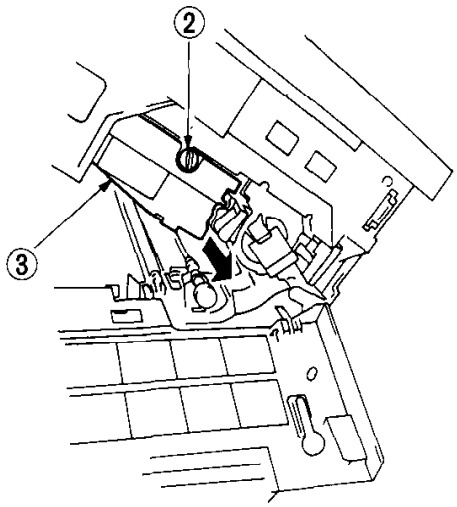

Figure 4-502

Caution:
Take care not to damage the photosensitive drum.
The photosensitive drum is highly susceptible to light, and exposure even to room lighting can lead to white spots or black bands on the copies.
As a rule, do not turn on the copier with the drum unit removed; otherwise, the registration roller and the transfer guide will interfere with each other, and rotation of the registration roller during WMUP will damage the roller.

2. Cleaning

If the surface of the photosensitive drum has become soiled, clean it with a flannel cloth coated with toner; do not use paper, lint-free or otherwise.

Caution:
Do not dry-wipe or use solvent.
Do not use drum cleaning powder.

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B. Primary Corona Assembly

1. Detaching the Primary Corona Assembly

1) Detach the drum unit.
2) Slide the lock ① of the top of the drum unit in the direction of the arrow.

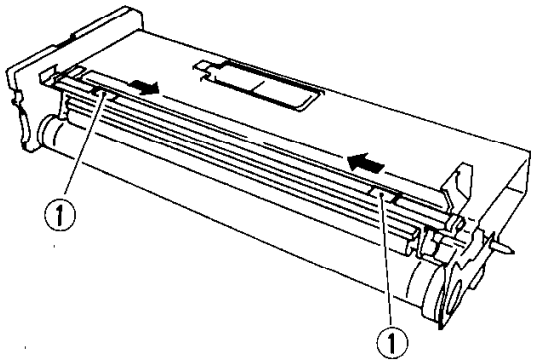

Figure 4-503

3) Detach the primary corona assembly unit ② together with the holder while rotating it in the direction of the arrow.

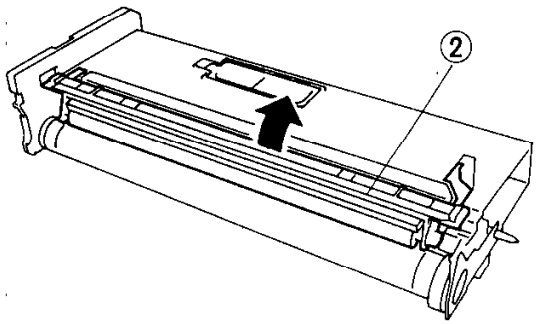

Figure 4-504

2. Cleaning the Cleaning Pad and the Primary Corona Roller

1) Detach the primary corona unit.
2) Place the primary corona assembly as shown in the figure, and clean the cleaning pad ③ with a cotton wad or folded lint-free paper.

Caution:
- Dry-wipe only. Do not use water, alcohol, or solvent.
- Be sure to use strokes in one direction only.

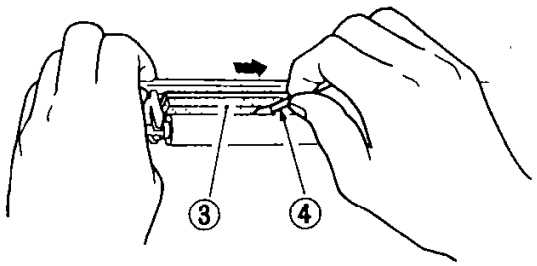

Figure 4-505

3) Clean the primary charging roller ⑤ with lint-free paper ⑥ while rotating it.

Caution:
- Dry-wipe only. Do not use water, alcohol, or solvent.
- Be sure to use strokes in one direction only.

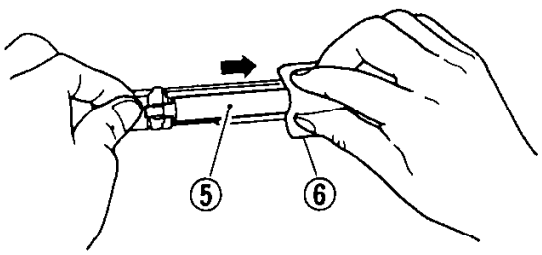

Figure 4-506

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3. Positioning the Solenoid for the Primary Charging Roller

Make adjustments by loosening the two screws used to fix the solenoid ③ in place and moving the solenoid ③ into the direction of arrow B so that ℓ in Figure 4-507 is 4.0 ±0.2 mm when the joint ① is butted against point ⓐ of the solenoid support ②.

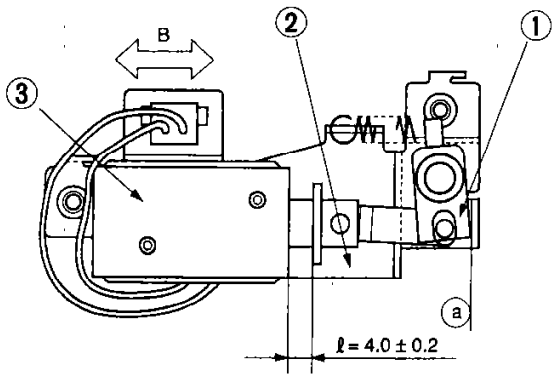

Figure 4-507

Caution:
You must make the adjustment whenever you have replaced the solenoid.

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C. Transfer Charging Assembly

1. Detaching the Transfer Roller

1) Open the front door.
2) Open the copier's top body.
3) Detach the static eliminator.
4) Detach the bushing ①, and lift the transfer roller to detach.

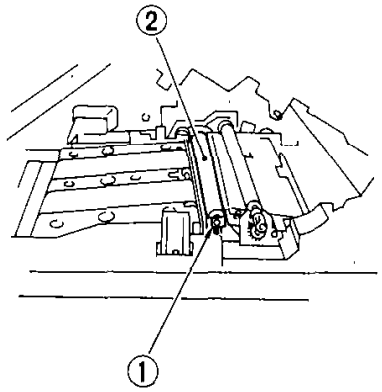

Figure 4-508

Caution:
Do not touch the surface of the roller.
Do not soil the surface of the roller.

2. Attaching the Drum Heater

1) Detach the front cover.
2) Open the copier's top body by operating the copier open/close lever.
3) Detach the inside cover.
4) Remove the three fixing screws ②, and detach the harness cover ①.

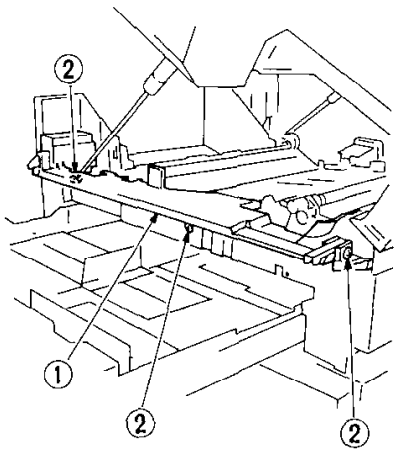

Figure 4-509

5) Detach the transfer roller and the static eliminator.
6) Detach the transfer guide.
7) While butting the two heaters against the transfer guide as shown in Figure 4-510, fix them in place using two screws ④; then, fix the harness using two harness bands ⑤ (front, rear).
8) Fix the harness with two SK binders ⑥ (front, rear) in place, and insert it into the transfer guide.

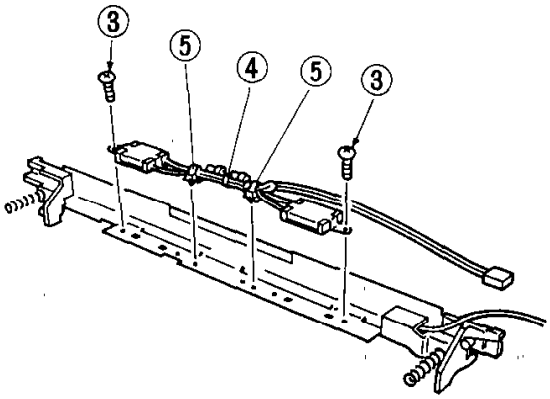

Figure 4-510

Caution:
When fixing the harness in place, make sure that the cap portions of the terminal are alternated as shown in Figure 4-511; if bundled in parallel, the harness will come into contact with the transfer roller.

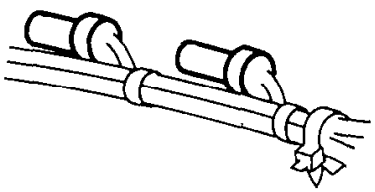

Figure 4-511

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9) Connect the connector ⑥ as shown in Figure 4-520.

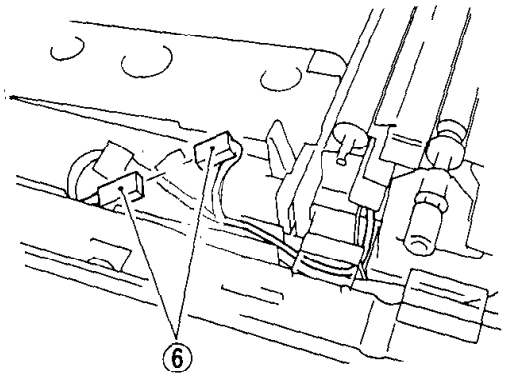

Figure 4-512

Caution:
Make sure that the spring at the rear is securely in the groove when attaching the transfer guide to the copier after attaching the drum heater.

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VI. DEVELOPING SYSTEM

1. Detaching the Developing Assembly

1) Open the copier's front door.
2) Shift the copier open/close lever to open the top unit.
3) Turn the engaging lever ① clockwise to release the developing assembly.
4) Remove the screw ②.
5) Pull out the developing assembly ③ slowly toward the front.

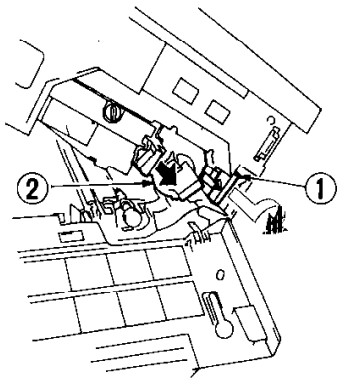

Figure 4-601

2. Detaching the Blade

1) Detach the developing assembly from the copier.
2) Remove the four screws ①, and detach the developing assembly cover ②.

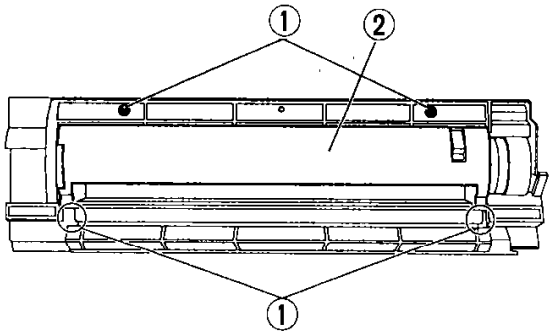

Figure 4-602

3) Place a newspaper or the like on the floor or desk, and pour the toner out of the developing assembly.
4) Remove the two screws ③, and detach the blade ④ together with its mount.

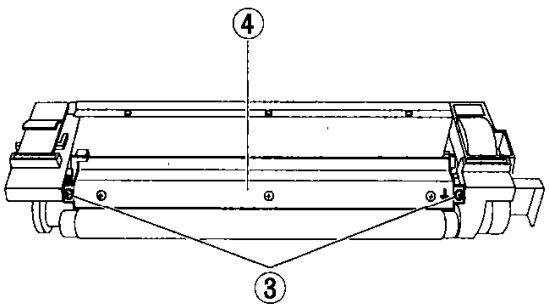

Figure 4-603

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3. Detaching the Developing Cylinder and Side Seal

1) Detach the developing assembly from the copier.
2) Detach the blade.

Caution:
The blade must be attached with high precision. Do not detach it on its own in the field, i.e., you must always detach it together with its mount.

3) Remove the screw ①, and detach the front cover ②.

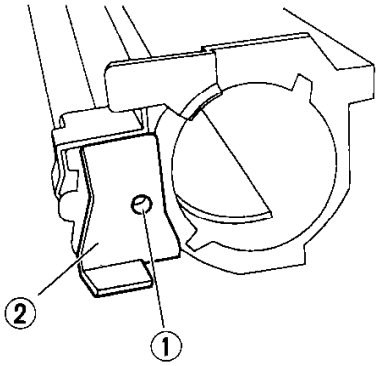

Figure 4-604

4) Remove the three screws ③, and detach the terminal ④, spacer case ⑤, and spacer ⑥.

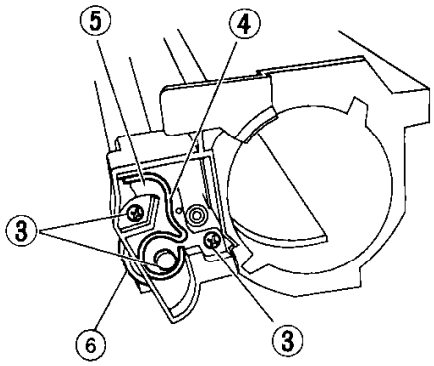

Figure 4-605

5) Remove the three E-rings ⑦, and detach the gear ⑧, gear ⑨, and gear ⑩.

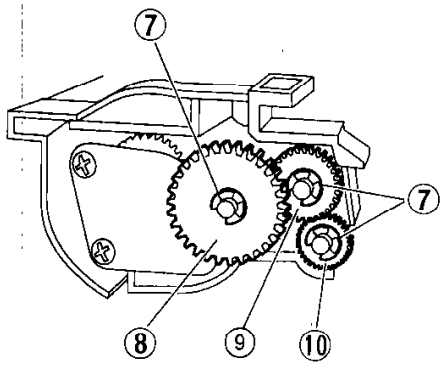

Figure 4-606

6) Remove the screw ⑪, and detach the butting spacer ⑫ and spacer case ⑬.

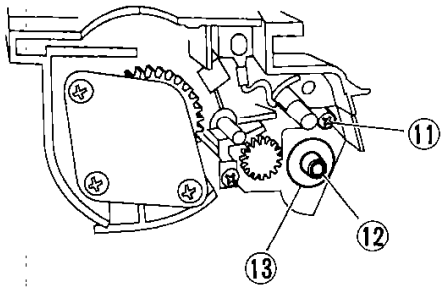

Figure 4-607

7) Detach the developing cylinder ⑭.

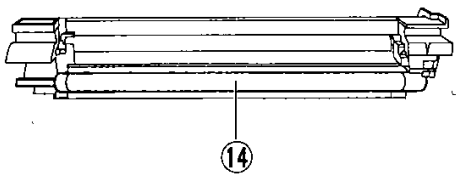

Figure 4-608

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8) Detach the side seal ⑮ (both ends).

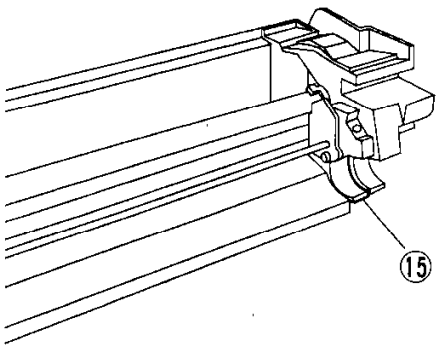

Figure 4-609

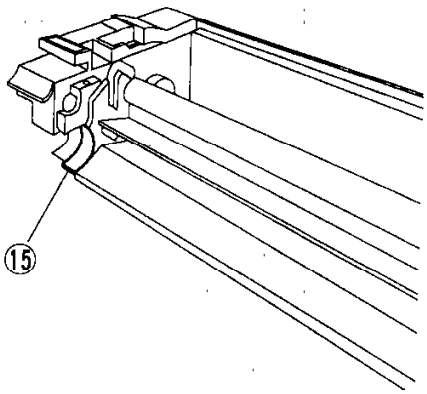

Figure 4-610

4. Attaching the Side Seal and Blade

1) Clean the area on which the side seal will be attached with alcohol.
2) Attach the side seal as indicate in Figure 4-511 (At this time, keep in mind that the side seal has different shapes at its front and rear.

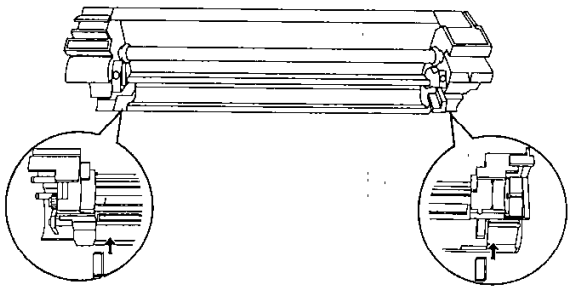

Figure 4-611

3) Make sure that the side seal and the container are in firm contact.
4) Butt the blade mount against the container, and fix it in place using two screws.
   When attaching the blade, place a sheet of paper ① on the developing cylinder to protect the developing cylinder; tighten the screws while pushing on points marked Ⓐ.

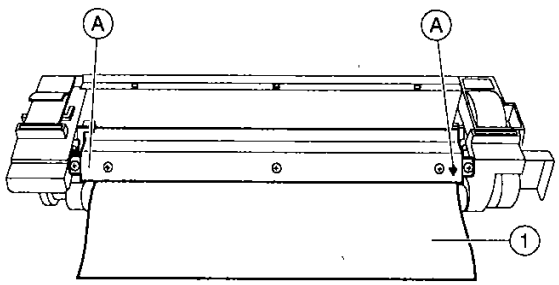

Figure 4-612

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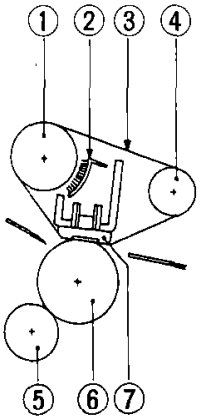
VII. FIXING SYSTEM

1. Construction



① Drive roller
② Cleaning brush
③ Fixing film
④ Tension roller
⑤ Fixing cleaning roller
⑥ Lower fixing roller
⑦ Fixing heater

Figure 4-701

Caution:
The fixing film is made of special material; do not touch it or soil it.
If you must replace the upper fixing unit, replace it on a unit basis in the field and leave component replacement to the workshop.

2. Detaching the Upper Fixing Unit

1) Open the copier's front cover.
2) Open the copier's top body.
3) Remove the two screws ①, and detach the fixing assembly cover ②.

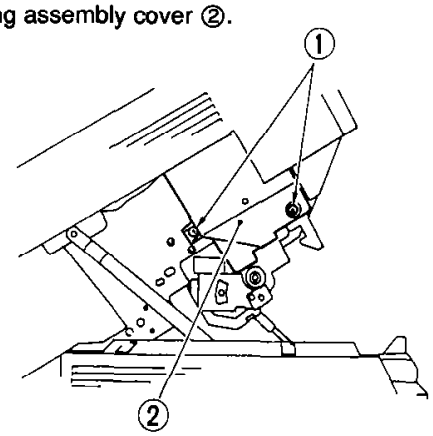


Figure 4-702

4) Disconnect the four connectors ③, and remove the screw ④.

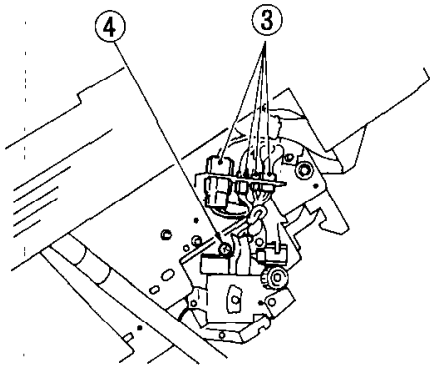


Figure 4-703

5) Open the fixing shutter ⑤, and put the screw removed in step 4) into the hole ⑥ in the front side plate.

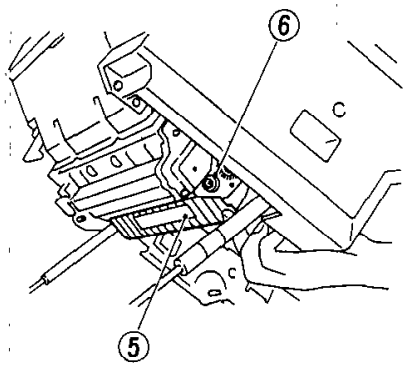


Figure 4-704

6) Pull out the upper fixing unit toward the rear.

Caution:
Do not touch the fixing film.

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3. Detaching the Fixing Film, Tension Roller, Drive Roller, Fixing Cleaning Brush, and Fixing Heater Unit

Caution:
Before going through the steps, make sure that the heater and the heater connector have cooled sufficiently.

1) Detach the upper fixing unit. (See "2. Detaching the Upper Fixing Unit on p. 4-38.")
2) Remove the screw ①, and detach the heater connector ② (front).

Caution:
If you are removing the screw ①, you must first make sure that the heater connector has cooled. The screw ① is a special screw; take care not to drop it.

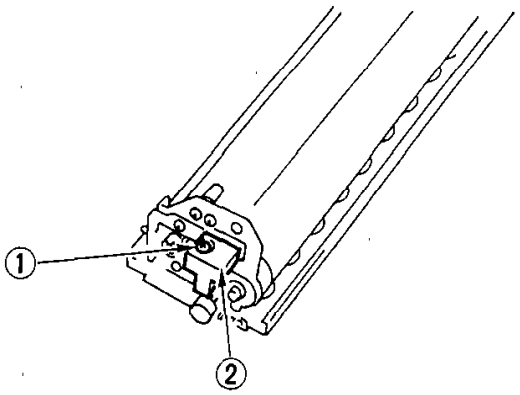

Figure 4-705

3) Remove the two E-rings ③ and the two washers ④.
4) Remove the screw ⑤.

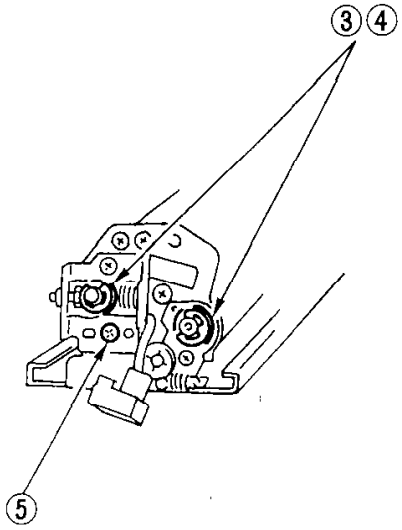

Figure 4-706

5) Release the pressure by positioning the screw ⑤ as shown in Figure 4-707.
6) Remove the screw ⑥, and detach the bushing ⑦.

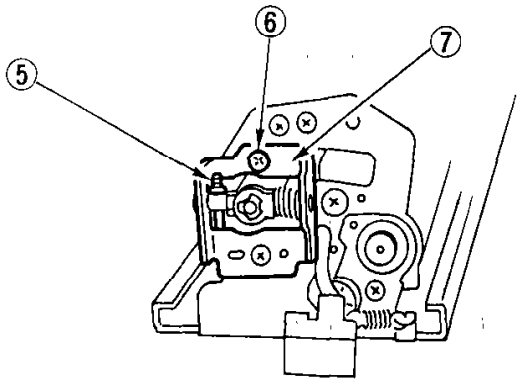

Figure 4-707

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7) Remove the screw ⑧, and detach the bushing ⑨; then, detach the upper fixing top side plate ⑩.

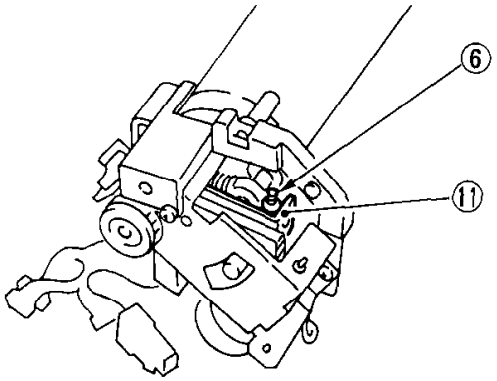

Figure 4-708

8) Release the pressure by positioning the screw ⑥ and the bushing (rear) as shown in Figure 4-709.

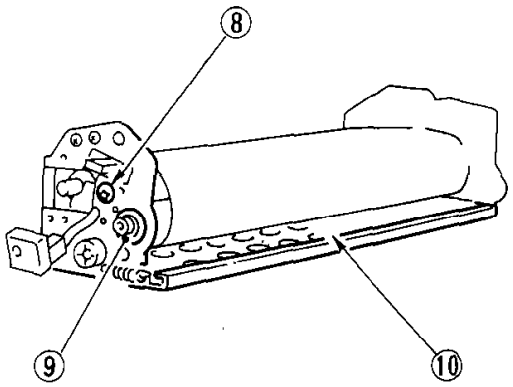

Figure 4-709

9) Pull out the fixing film ⑫ toward the front.
10) Detach the tension roller ⑬.

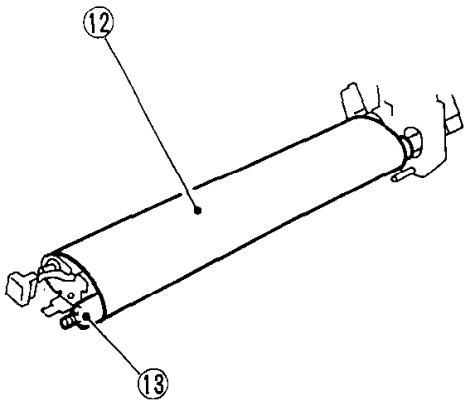

Figure 4-710

11) Remove the screw ⑭, and detach the fixing film sensor ⑮.

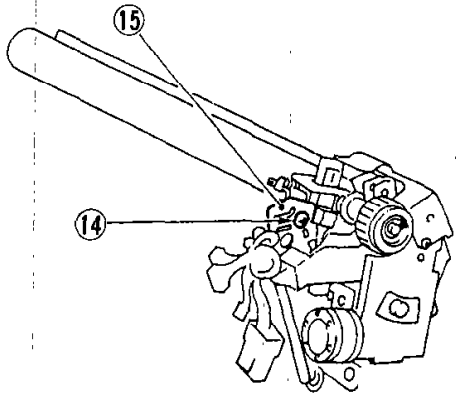

Figure 4-711

12) Remove the E-ring ⑯.

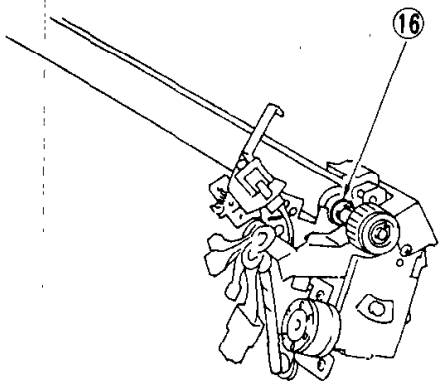

Figure 4-712

13) Remove the washer ⑰ and the bushing ⑱, and detach the drive roller ⑲.

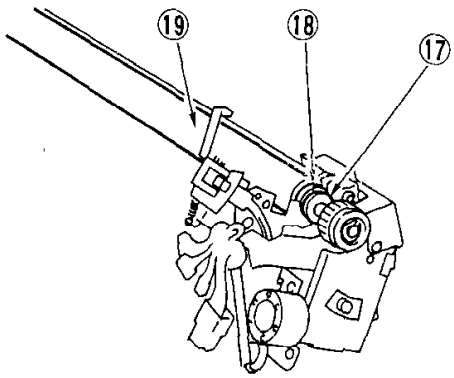

Figure 4-713

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14) Lift the delivery side, and detach the fixing cleaning brush ⑳.

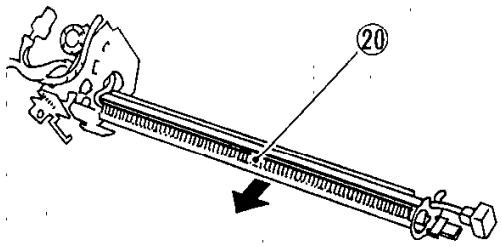

Figure 6-714

15) Remove the two screws ㉑, and detach the cover ㉒.

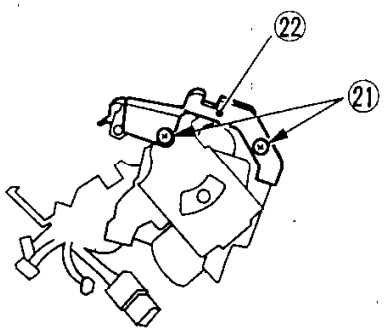

Figure 4-715

16) Remove the two screws ㉓, and detach the fixing film motor unit ㉔.

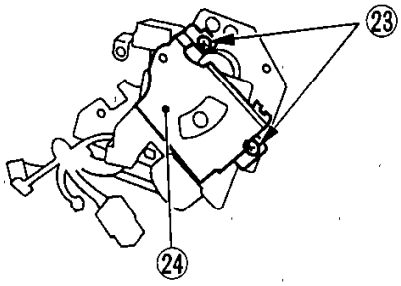

Figure 4-716

17) Remove the screw ㉕, and detach the cover ㉖.
18) Remove the screw ㉗, and disconnect the heater connector ㉘.

Caution:
If you are removing the screw ㉗, you must first make sure that the heater connector has cooled. The screw ㉗ is a special screw; take care not to lose it.

19) Remove the C-ring ㉙, and detach the bushing ㉚, leaving the fixing heater behind.

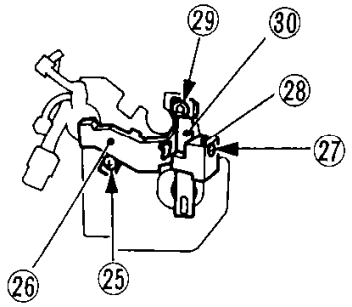

Figure 4-717

Caution:
Do not touch the surface of the heater.

4. Points to Note When Attaching the Fixing Film

- Make sure that the cut off is toward the rear.
- Make sure that the front side is aligned with the groove of the heater.

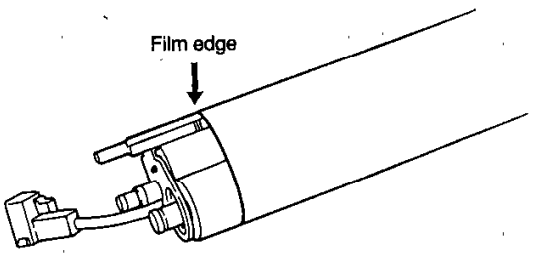

Figure 4-718

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5. Points to Note When Attaching the Heater Connector

- When attaching the heater connector to the fixing heater, take care not to damage the heater.
- When tightening the screw, hold the connector taking care that its top and bottom are free of pressure; be careful not to tighten the screw excessively.

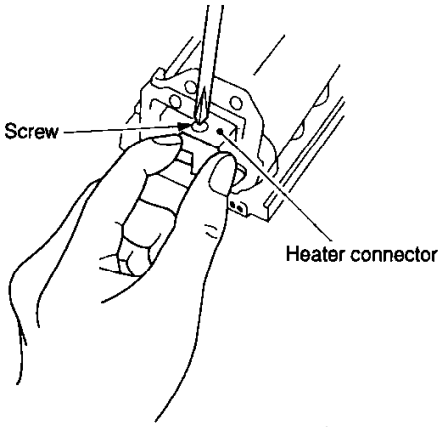

Figure 4-719

6. Points to Note When Replacing the Fixing Upper Unit

- If you have replaced the upper fixing unit, you must store the resistance of the heater in service mode (No. 304; see p. 3-77.)

Caution:
Do not touch the surface of the heater.

7. Adjusting the Fixing Film Drive Roller Pressure

If a fixing fault occurs, be sure to go through the following to adjust the pressure of the drive roller.

1) Detach the fixing cover.
2) Detach the inside cover of the copier's front side.
3) Close the copier's upper body, and insert the door switch actuator.
4) Press the service mode switch (SW302).
   - The copier enters service mode, and the display indicates '1'.
5) Press '4' on the keypad.
   - The display indicates '4'.
6) Press the AE key.
   - The copier enters operation check mode, and the display indicates '401'.
7) Press '5' on the keypad.
   - The display indicates '405'.
8) Press the Start key.
   - The copier enters fixing film initial rotation mode (405) to return the fixing film to its proper position.
   - The fixing film stops automatically as soon as it reaches its proper position.
   - The copier indicates the position of the film in the copy density indicator.
9) Open the copier's top body.
10) Check that the arrow ① is at the middle of the memory as shown in Figure 4-720.

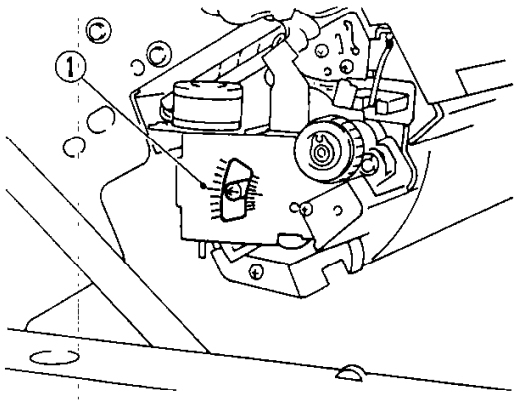

Figure 4-720 (rear view)

11) Close the copier's top body, and activate service mode.
12) Press '4' on keypad; when the display indicates '4', press the AE key.
13) Press '4' on the keypad; when the display indicates '404', press the Start key.
   - The copier enters fixing tension roller mode (404).
   - The fixing tension roller becomes fixed, and the fixing film rotates idly.
   - The count indicator indicates how long the fixing film sensor has remained on.

Caution:
If the copy count indicator keeps indicating '0' or '528' during adjustment, immediately press the Stop key to de-activate service mode.

If the copy countis '180' or higher and '348' or lower and has not changed, go to step 17).

Or, if 10's and 100's do not change, go to step 17);

14) Loosen the fixing screw ② slightly; i.e., move it to the left about 1 mm.

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15) Turn the adjusting screw ③ so that the copy count is '180' or higher' and '348' or lower.

Caution:
Adjust so that 10's and 100's will not change; ignore 1's may change ±5.)

- A clockwise turn decreases the reading.
- A counterclockwise turn increases the reading.

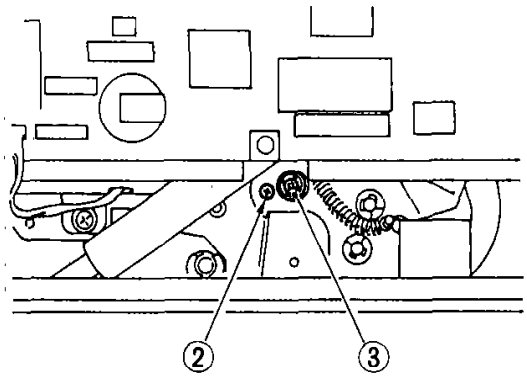

Figure 4-721

16) When the reading in the copy counter is appropriately correct, tighten the screw ②; make sure that the reading is appropriate after tightening the screw.
17) Press the Start key.
    - The copier enters check mode (404), and the fixing film rotates idly for about 2.5 min; check that the fixing film has not shifted from the adjusted position.
    - The copy count indicator indicates " 00 " or " ∩0 "; if " ∩0 " is indicated, repeat steps starting with 13).
      If " 00 " is indicated, repeat steps 4) through 10).
18) Attach the cover.

8. Detaching the Lower Fixing Unit

1) Detach the delivery roller. (See "1. Detaching the Delivery Roller." on p. 4-23.)
2) Detach the delivery cover.
3) Remove the screw ①, and detach the fixing shutter open/close block ②.

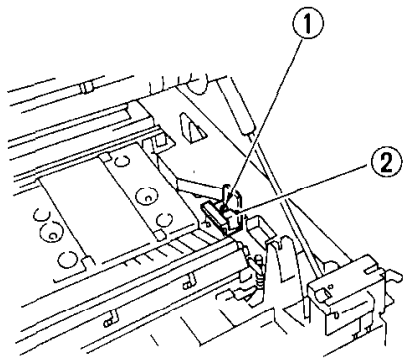

Figure 4-722

4) Remove the E-ring ③, and detach the lower fixing unit ④.

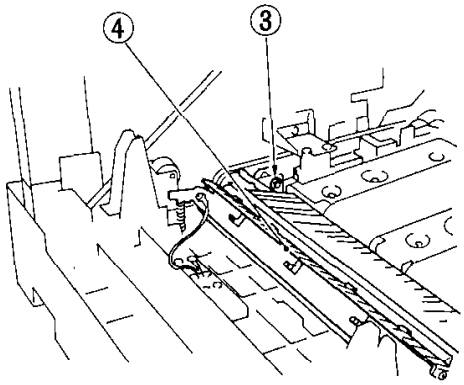

Figure 4-723

Caution:
Do not touch the surface of the fixing cleaning roller or the lower fixing roller.

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9. Detaching the Separation Claw/ Lower Fixing Claw and Fixing Cleaning Roller

1) Detach the front door.
2) Remove the screw ①, and detach the separation claw unit ②.

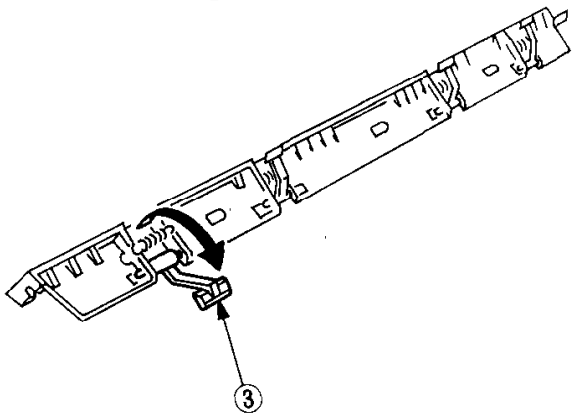

Figure 4-724

3) Detach the separation claw ③ from the separation claw unit.

Caution:
Take care not to misplace the spring.

4) Detach the lower fixing roller ④ together with the bushing ⑤.

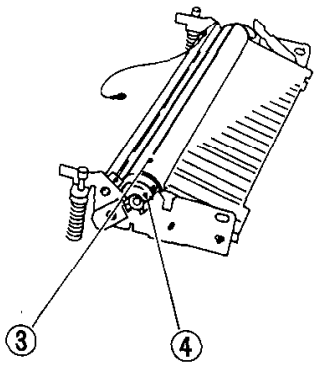

Figure 4-725

5) Detach the bushing ⑥ found at the front, and detach the HIGH-TEMPERATURE WARNING cover ⑦.

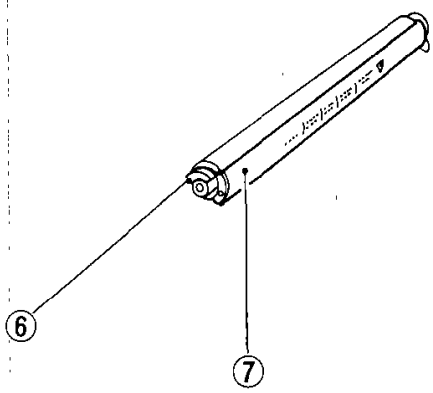

Figure 4-726

6) Lift the fixing cleaning roller to detach.

10. Adjusting the Lower Fixing Roller Nip

If fixing faults occur, make the following adjustments.

The nip is correct if as shown below; otherwise, turn the bolt to make adjustments.

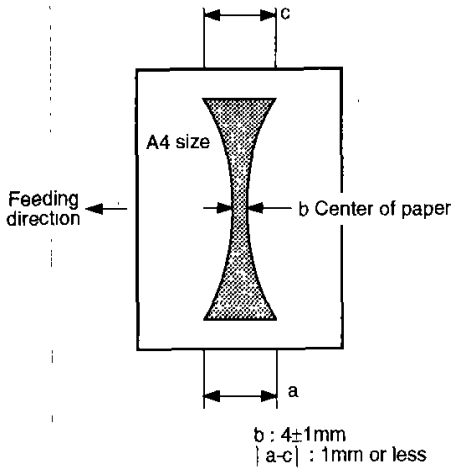

Figure 4-727

Note:
a and c represent points 10 mm from both ends of copy paper.

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a. Measuring the Nip

Measure the nip immediately after turning on the copier before the beginning of a work day.

1) Open the copyboard cover, and make a solid black copy in A4.
2) Place the copy in the multifeeder with the solid black face up.
3) Press the service mode switch (SW302) using a hex key.
   - The copier enters service mode, and the display indicates '1'.
4) Press '4' on the keypad.
   - The display indicates '4'.
5) Press the AE key.
   - The copier enters operation/check mode, and the display indicates '401'.
6) Press '6 on the keypad.
   - The display indicates '406'.
7) Press the Start key.
   - The above operations cause the multifeeder to pick up paper so that you can take measurements as in Figure 4-727; the paper will then be discharged.

Reference:
The copy paper stops while it is half way under the fixing roller; and, about 10 sec later, it will be automatically discharged.

8) Measure the nip.

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VIII. ELECTRICAL

A. DC Controller PCB

1. Detaching the DC Controller PCB

1) Disconnect the connector of the DC controller.
2) Remove the four screws ①, and detach the DC controller PCB together with its mount.

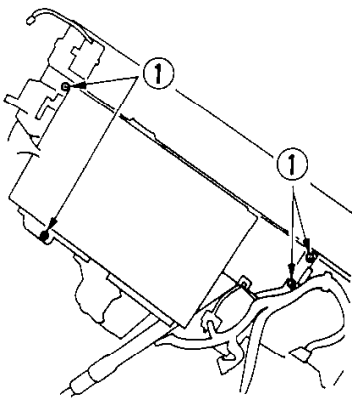

Figure 4-801

2. Points to Note When Replacing the DC Controller PCB

- When sending the DC controller PCB to the workshop or factory, put it in a conducting bag while keeping it intact with the mount. Use a conducting bag whose one side is transparent, and make sure that the face of the DC controller PCB shows through the transparent side of the bag.
- After replacement, perform following; see p. 3-83:
  ①enter the value recorded on the service label;
  ②adjust the multifeeder paper width sensor;
  ③adjust the intensioy of the scanning lamp; and
  ④adjust AE.

B. Composite Power Supply PCB

1. Detaching the Composite Power Supply PCB

1) Detach the lower rear cover and the delivery cover.
2) Remove the screw ①, and detach the switch support plate ②.
3) Remove the screw ③, and detach the power cord cover 1 ④.

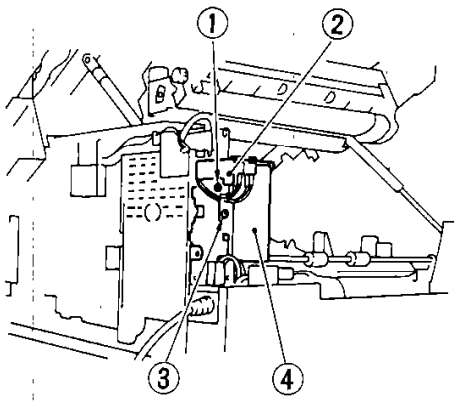

Figure 4-802

4) Remove the screw ⑤, and shift the power cord cover 2 ⑥.
5) Disconnect the AC connector ⑦, and remove the screw ⑧ to detach the grounding wire ⑨.

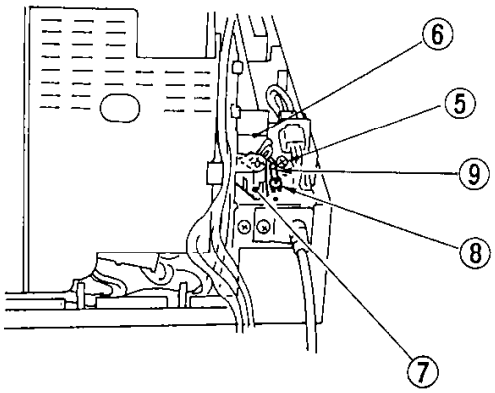

Figure 4-803

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6) Remove the three screws ⑩, and detach the power cord mount ⑪.

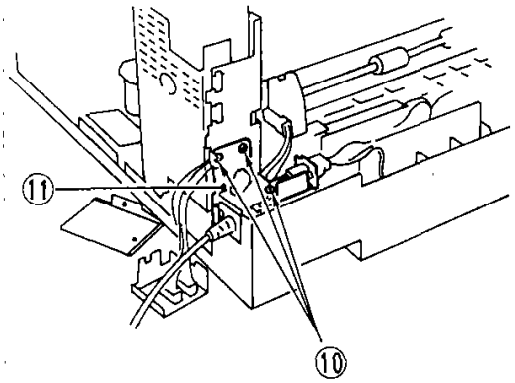

Figure 4-804

7) Disconnect all connectors from the composite power supply PCB.
8) Remove the screw ⑫, and detach the grounding wire ⑬; then, detach the harness guide ⑭ from the power supply side plate.

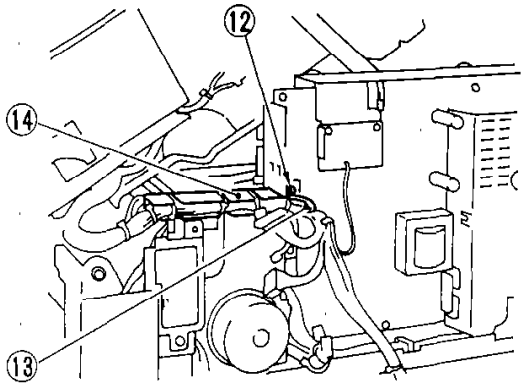

Figure 4-805

9) Remove the screw ⑮, and detach the composite power supply PCB ⑯.

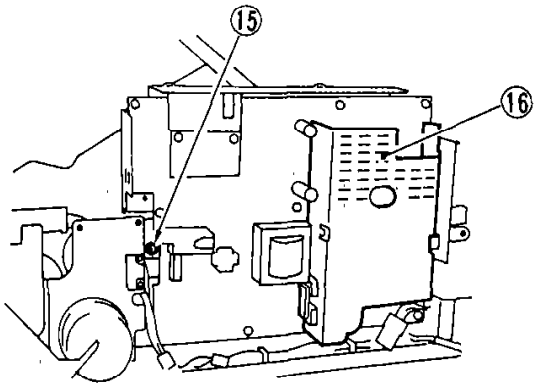

Figure 4-806

2. Points to Note When Handling the Composite Power Supply PCB

- Some capacitors used on the PCB may retain charges even when the copier remains off. For this reason, you must take care never to short the terminals of the capacitor whenever you have detached the PCB.
- Enter the settings (Nos. 315 through 318) recorded on the label attached to the composite power supply (service part) in service mode. (See p.3-77)

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C. AE Sensor PCB

1. Points to Note When Replacing the AE Sensor

- After replacement, perform the following; see p. 3-83:
  ①Adjust AE.

D. Intensity Sensor PCB

1. Points to Note When Replacing the Intensity Sensor

- After replacement, perform the following; see p. 3-83:
  ①Adjust the intensity of the scanning lamp; and
  ②Adjust AE.

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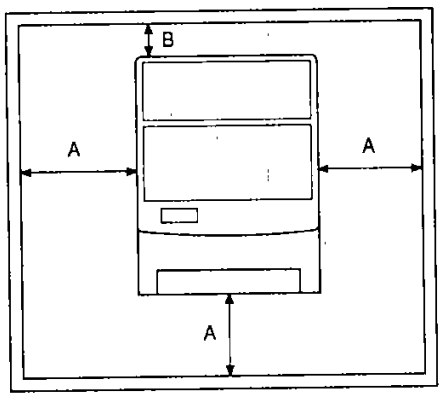
I. SELECTING THE SITE

Keep the following in mind when selecting the site of installation; if possible, pay a visit to the user's before the delivery of the machine.

- The site must provide a power outlet that may be used exclusively for the machine and that meets the rating ±10%.
- The site must be 7.5° to 30°C in temperature and 10% to 80% in humidity. In particular, avoid areas near water faucets, boilers, humidifiers, or refrigerators.
- Avoid areas near sources of fire, areas subject to dust or ammonium gas, or areas exposed to the direct rays of the sun; if necessary, provide curtains to shut out the sun.
- The site must be well ventilated.
- Make sure that the floor will remain in contact with the copier's feet and will keep the copier level.
- Make sure that there will be work space that meets the measurements shown in Figure 5-101; in other words, there must be distances A and B around the copier when measured with its front door open.



A : 50cm
B : 10cm

Figure 5-101

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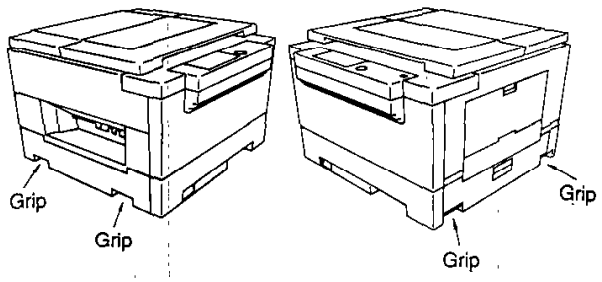
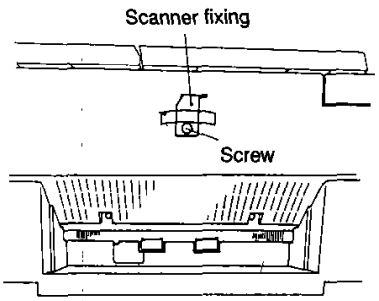
II. UNPACKING AND INSTALLING THE COPIER

When a metal part is brought in from a cold to warm environment, droplets of water can develop on the surface of the part. This phenomenon is called *condensation*, and condensation in a copier can lead to faulty images. If the copier has been moved from a cold to warm place, leave it alone for about one hour or more before unpacking it.

A. Unpacking and Removing Fixings

Step	Work	Remarks
1	Unpack the copier.	
2	Detach the plastic cover, and place the copier on the pedestal holding its grips; be sure to work in a group of two. Install the Cassette Feeding Module-B1 or -A1 (option) according to its Installation Procedure if the copier is to be placed on it.	 **Figure 5-201**
3	Open the cardboard box, and take out all the accessories.	Check that none of the following accessories is missing: • Copy tray • Cassette (Universal) • Operator's Manual • Drum unit • Installation Procedure • Toner • Drum replacement warning label
4	Remove all tape from the outside of the copier. Take out the cassette from the cardboard box, and remove the cushions from inside the cassette; then, slide the cassette into the copier.	Make sure that the paper size plate and size label (1 pc. each) is inside the cassette.
5	Remove the tape from the scanner fixing found on the outside of the left cover, remove the screw, and slide the fixing to the right to detach it to the front. • Keep the fixing stored for possible relocation of the machine.	 **Figure 5-202**

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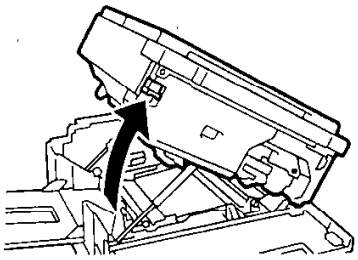
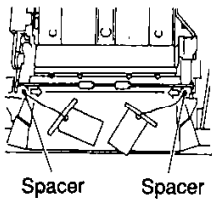
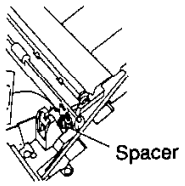
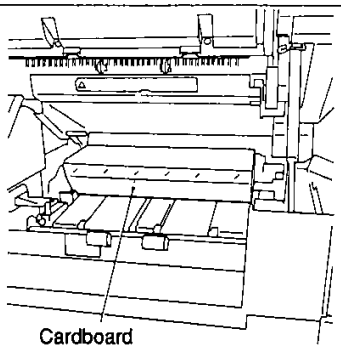
Step	Work	Remarks
6	Open the copyboard cover, and remove the protective sheet.	
7	Open the front cover, and push the lever found on the left side up in the direction of the arrow to open the copier's top body.	 Figure 5-203
8	Pull up the spacer (front and rear, 1 pc. each) of the fixing roller in the direction of the arrow until a click is heard.	 Figure 5-204
		 Figure 5-205
9	Remove the two pieces of cardboard (cushion) from the feeding assembly.	 Figure 5-206

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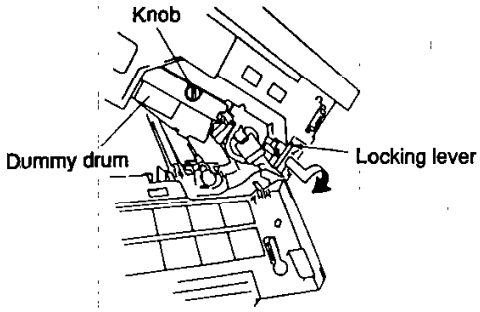
Step	Work	Remarks
10	Pull the developing locking lever toward the front, and turn it clockwise to release it.	 Figure 5-207
11	Detach the knob, and remove the dummy drum from the copier. (Keep the knob for later.)	
12	Remove the developing assembly, and check that the developing cylinder is free of scratches or dirt.	
13	Install the developing assembly, and lock the developing assembly.	
14	Close the copier's top unit.	

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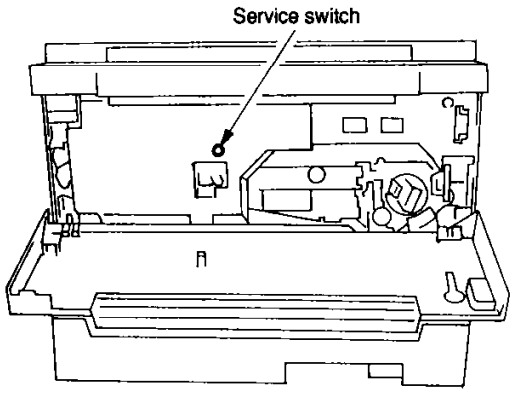
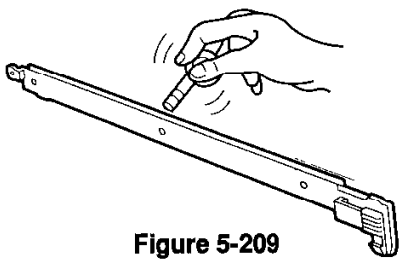
B. Turning On the Copier

Step	Work	Remarks
1	Connect the power plug to the power outlet.	**Caution:** • Make sure that the power outlet is the rating ±10%.
2	Turn on the power switch.	Make sure that the Add Paper message flashes. • Press the keypad and the Clear key to make sure that the copy count indication is correct.
3	Supply toner according to the instructions given on the toner supply label attached behind the front door.	
4	Push the service switch (SW302) with a hex key. • Execute 'No. 401' in service mode; press 4 on the keypad, AE key, and Start key in sequence.	Toner is supplied from the toner container to the developing assembly. **Caution:** Do not turn off the power or pull out the door switch actuator while the machine is in operation.  **Figure 5-208**
5	Make sure that step 5 has been completed; then, turn off the power, and open the copier's top unit.	
6	Remove the static eliminator, and clean it with the static eliminator brush; then, set the static eliminator.	 **Figure 5-209**
7	Release the developing assembly by the developing assembly releasing lever.	

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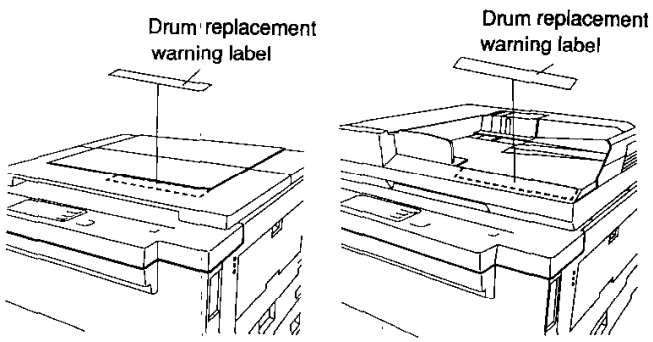
Step	Work	Remarks
8	Install the drum unit.	See "C. Attaching the Drum Unit."
9	Lock the developing assembly, and close the copier's top unit.	
10	Turn on the power.	
11	Execute 'No. 313' and 'No. 314' to enter the value recorded on the label.	To Enter the Value Select 'No. 313' in service mode, and enter the value (PRIMARY) using the keypad. (If '-', press the % key before entering the value.) Then, press the Start key to store the value. Likewise, enter the value for 'IP_OFST' by executing 'No. 314' in service mode.
12	Set the settings for user mode and settings mode in service mode to suit the needs of the user.	
13	Tailor the cassette to suit the desired size by operating the size guide plate and size detecting lever; then, attach the size label.	See "E. Changing the Cassette Size."
14	Put copy paper in the cassette, and set the cassette in the copier.	• Make sure that the Add Paper message turns off. • Make sure that the paper indicator matches with the size of the cassette. • Press the keys on the control panel other than the Copy Start key to make sure that all respective operations are normal.
15	Attach the copy tray.	
16	Attach the drum replacement warning label. (North America only)	W/O ADF W/ ADF  **Figure 5-210**
17	Remove the door switch activator, and close the front door.	

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C. Checking the Images and Operations

Step	Work	Checks/Remarks
1	Place the Test Sheet on the copyboard, and check the copies.	• Make sure there is no abnormal sound. • Check the copy images for each standard reproduction ratio. • Make sure that as many copies as specified are made normally. • If the copy image is faulty, perform the "Image Adjustment Basic Procedure."
2	Make copies in manual mode.	Make sure that the copying operation is normal.
3	Make sure that the external covers are free from scratches and deformations.	
4	Clean the area around the copier.	
5	Move the machine to its site of installation.	Make sure that the copier is more or less level.

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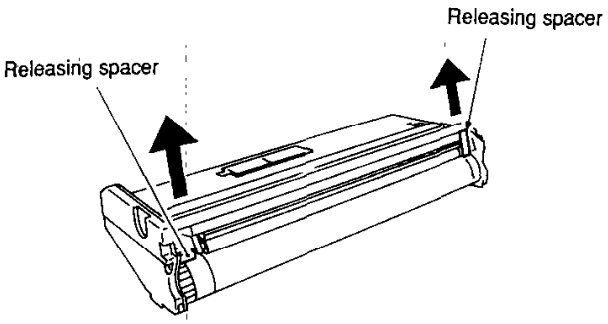
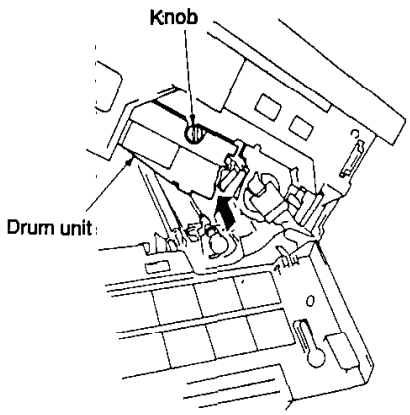
D. Attaching the Drum Unit

Step	Work	Checks/Remarks
1	Unpack the drum unit, and remove the light-blocking sheet.	
2	Remove the primary charging roller releasing spacer.	 **Figure 5-211** Take care not to damage the surface of the drum and not to touch the primary charging roller.
3	Set the drum unit to the copier, and fix it in position using the knob used to keep the dummy drum.	 **Figure 5-212** Be sure to insert the drum unit straight along the copier's rail.
4	Fill out the label, and attach it to the drum unit cover.	日付 data date Datum カウンター counter compteur Zähler 備考 notes note Notiz **Figure 5-213**

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E. Changing the Cassette Size

Change the cassette size to suit the user's needs.

1) Slide the cassette out of the copier.
2) Move the length plate inside the cassette to suit the length of the paper size.

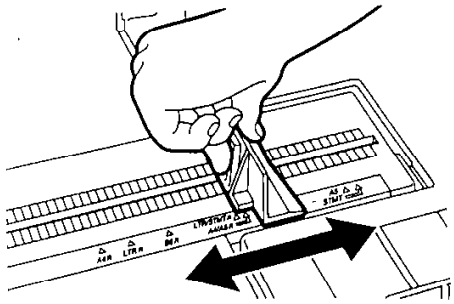

Figure 5-214

3) Move the width plate inside the cassette to suit the width of the paper to be used.

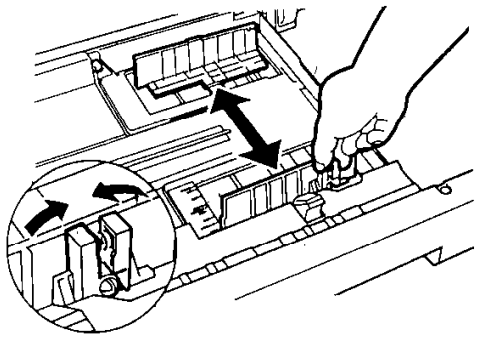

Figure 5-215

4) Move the paper size lever found toward the front of the cassette so that it is aligned with the size of the paper to be used.

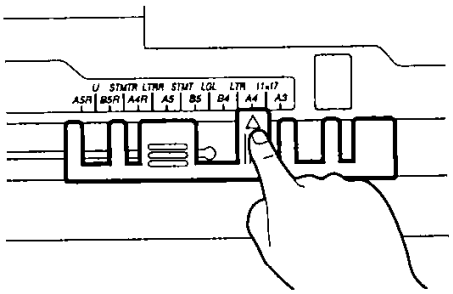

Figure 5-216

Caution:
Failure to adjust the paper size lever will lead to jams or soiling.

5) Take out the paper size plates for the cassette, and pick out the four plates representing the most frequently used size; attach the labels.

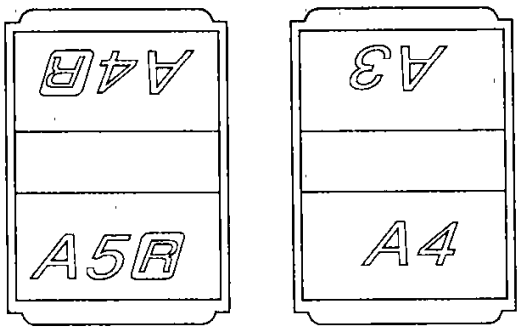

Figure 5-217

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6) Set the paper size plates selected in step 4).

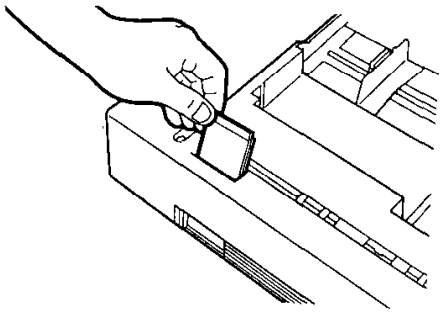

Figure 5-218

Caution:
If you are setting the plate for the position representing the universal (u) cassette, you must perform the work described for "universal cassette paper size setting (505); see p. 3-81.

■ Points to Note When Handling the Photosensitive Drum after Installation

The copier's photosensitive drum is highly susceptible to light; mere exposure to room light can affect the drum enough to produce white spots or black lines on the copies. Keep the following in mind:

- Do not spend more than 5 min when removing jams.
- After detaching the drum unit from the copier during servicing work, be sure to protect it in the light-blocking sheet that came with the drum or fresh copy paper, and place the drum in a dark place.

Do not touch the photosensitive drum or primary charging roller.

If you have soiled the surface of the drum inadvertently, wipe it using a flannel cloth coated with toner; do not use paper, lint-free or otherwise.

Do not dry wipe or use solvent to clean the drum.

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III. RELOCATING THE COPIER

If you must relocate the copier by truck or using other means of transportation, perform the following work:

Step	Work	Checks	Remarks
1	Move the lens to the Direct position.		*Direct position* refers to the position of the lens after warm-up initiated by power-on.
2	Take out the drum unit.	Put the drum unit in a box for transport.	
3	Fix the scanner in place.		Use the fixing removed at time of installation.
4	Tape the front door and delivery assembly in place.		
5	Place A3 copy paper on the copyboard glass, and tape the copyboard cover in place.		

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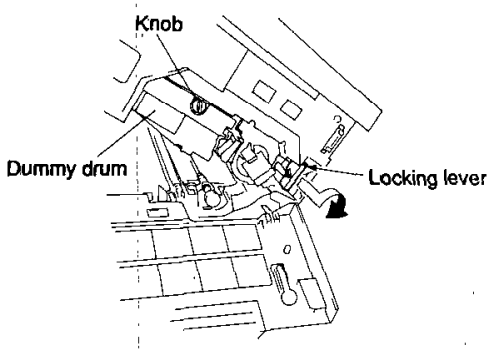
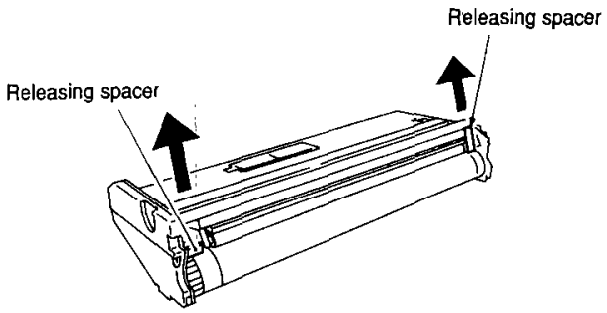
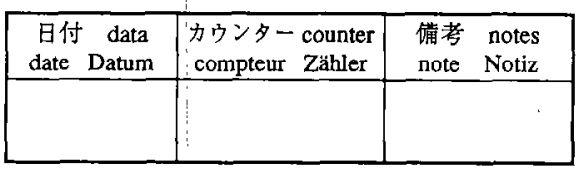
IV. REPLACING THE DRUM UNIT

Go through the following when replacing the drum unit:

Step	Work	Remarks
1	Turn off the copier, and open the front door and the copier's top unit.	
2	Release the developing assembly, and remove the knob to remove the drum unit.	 Figure 5-401
3	Unpack the new drum unit, and remove the light-blocking sheet.	
4	Remove the primary charging roller releasing spacer.	 Figure 5-402 Take care not to damage the surface of the drum and not to touch the primary charging roller.
5	Set the drum unit to the copier, and attach the knob used to fix the old drum unit.	
6	Fill out the label, and attach it to the drum unit cover.	 Figure 5-403
7	Lock the developing assembly, and close the copier's top unit.	

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Step	Work	Remarks
8	Turn on the door switch using the door switch actuator; then, shift the power switch to 'ON'.	
9	Execute 'No. 313' and 'No. 314' in service mode to enter the value recorded on the drum label.	To Enter the Value Select 'No. 313' in service mode, and enter the value (PRIMARY) using the keypad. (If '-', press the % key before entering the value.) Then, press the Start key to store the value. Likewise, enter the value for 'IP_OFST' by executing 'No. 314' in service mode.
10	Remove the door switch actuator, and close the front door.	

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V. INSTALLING THE CONTROL CARD IV N

Caution:
Be sure to disconnect the copier's power plug before starting the installation work.

1) Open the front cover
2) Open the copier's top body by operating its open/close lever.
3) Detach the front cover.
4) Take out the cartridge.
5) Detach the inside cover.
6) Loosen the screw on the upper rear cover.
7) Loosen the two screws on the copyboard glass.
8) Detach the face plate ① from the control card cable inlet.

(When detaching the face plate ①, detach it in the direction of the arrow using pliers or screwdriver.)

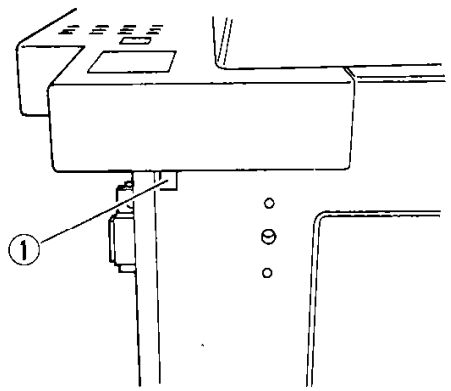

Figure 5-501

9) Fix the Control Card IV N ③ to the copier using a screw ② (M4×12); at the time, be use that the copier's emboss ④ is fitted in the hole in the Control Card IV N.

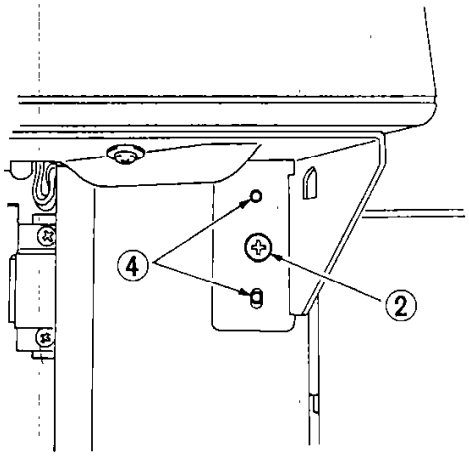

Figure 5-502

10) Disconnect the copier's dummy connector ⑤.

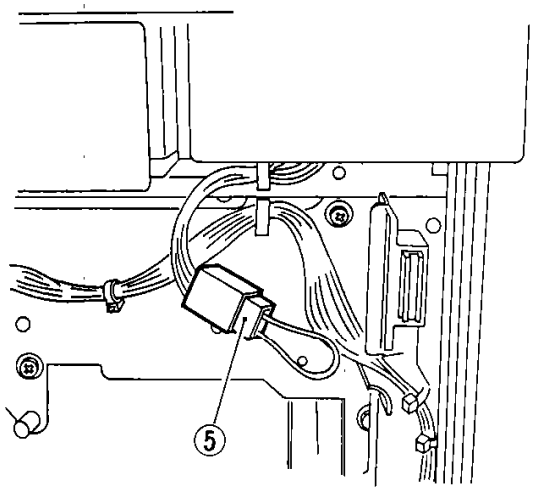

Figure 5-503

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11) Connect the connector ⑥ of the Control Card IV N.

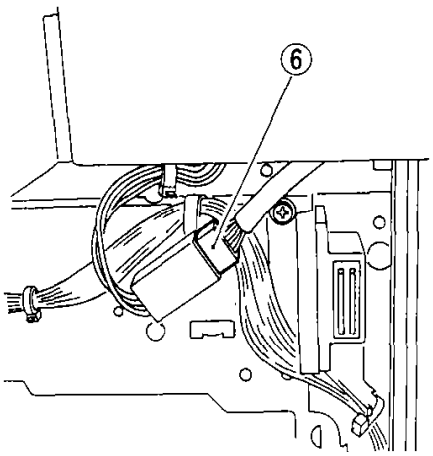

Figure 5-504

12) Connect the copier's power plug, and turn on its power switch to check the operation of the Control Card IV N.

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I. PERIODICALLY REPLACED PARTS

Some parts of the copier must be replaced on a periodical basis to ensure a specific level of performance; replace them as indicated regardless of the presence of visible damage.
Plan the replacement to coincide with a scheduled visit.

A. Periodically Replaced Parts

as of MAY 1994

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Static eliminator	FG5-2912	1	60,000	

The above values are estimates only and subject to change based on the future data.

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II. DURABLES

The parts shown in the table may require replacement because of deterioration or damage over the period of warranty; replace them when they fail using the table as a guide.

A. Copier

as of MAY 1994

No.	Parts name		Parts No.	Q'ty	Life (copies)	Remarks
1	Pick-up roller		FB2-2251-000	1	100,000	See Note 1.
2	Pick-up separation pad		FG5-2922-000	1	100,000	See Note 1.
3	Multifeeder pick-up roller		FB1-8581-000	1	100,000	See Note 1.
4	Multifeeder separation pad		FB2-2167-000	1	100,000	
5	Fluorescent lamp		FH7-3271-000	1	100,000	
6	Fixing cleaning roller		FB2-2323-000	1	100,000	
7	Transfer roller		FB2-2223-000	1	100,000	
8	Upper fixing unit	100V	FG5-2926-000	1	200,000	
		115V	FG5-2927-000			
		220/240V	FG5-2928-000			
9	Lower fixing roller		FB2-2316-000	1	200,000	
10	Lower fixing separation claw		FB1-7275-000	1	200,000	
11	Pre-exposure lamp		FG5-2891-000	1	200,000	Replace with item 12 or 12-1 through 12-4.
12	Developing assembly		FG5-3275-000	1	100,000	
12-1	Developing cylinder		FB2-3834-000	1	100,000	
12-2	Side seal (right)		FB2-3825-000	1	100,000	
12-3	Side seal (left)		FB2-3826-000	1	100,000	
12-4	Developing blade unit		FG5-3276-000	1	100,000	

Note:

1. The life represents the number of copies actually made using the part.
2. The above values are estimates only and subject to change based on future data.

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B. Cassette Feeding Module-B1/Cassette Feeding Module-A1

as of MAY 1994

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Pick-up roller	FB2-2251-000	1	100,000	Actual usage
2	Pick-up separation pad	FG5-3614-000	1	100,000	Actual usage

Note:
The above values are estimates only and subject to change based on future data.

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III. PERIODICAL SERVICING

The copier does not have items that require periodical servicing; however, it is recommended that the following work items be performed during any visit to the user's.

Step	Work	Checks	Remarks
1	Meet the person in charge of the copier.	Check the general conditions.	
2	Make test copies in Direct, Reduce, Enlarge, and page separation.	Check the following: a. image density b. white background for soiling c. characters (clarity) d. leading edge (non-image width) e. left/right margin f. fixing, registration, back (soiling) g. abnormal noise h. counter (operation)	standard: 2.5 ±1.5 mm (Direct, one-sided) standard: 2.5 ±1.5 mm (Direct/one-sided)
3	Clean the static eliminator and feeding assembly.		Use the special brush (accessory) to clean the static eliminator.
4	Clean the fixing/delivery assembly. • paper guide plate • separation claw		Use solvent. Use solvent.
5	Perform work according to the number of copies made (See p. 6-2).		
6	Clean the copyboard cover and copyboard glass.		
7	Make test copies.		
8	Make sample copies.		
9	Arrange the sample copies, and clean the area around the copier.		
10	Record the final counter reading.		
11	Fill out the Servicing Sheet, and report to the person in charge.		

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IV. SERVICING CHART

Caution:
Do not use solvents or oils other than those specified.

△ : clean ● : replace ☆ : lubricate □ : adjust ◎ : inspector clean

Unit	Parts	every 20,000	every 60,000	every	every year	Remarks
External	Copyboard glass	△				Use alcohol.
Pick-up assembly	Pick-up roller	△				
Scanner drive assembly	Scanner rail		☆			Use alcohol solution; then, apply lubricant.
Feeding assembly	Transfer guide assembly	△				Use a moist cloth.
	Feeding belt	△				
	Feeding assembly mount	△				
Optical assembly	Reflecting plate for original exposure	△				Use a blower brush; if the soiling is excessive, use alcohol.
	Side reflecting plate for original exposure	△				
	No. 1 through No. 6 mirrors	△				
	Lens	△				
	Dust-proofing glass	△				
Drum kit	Clearner base	△				Actual use of the drum kit.
Charging assembly	Charging roller	△				
	Charging roller cleaner	△				
	Static eliminator	△	●			
Developing assembly	Developing spacer	△				
Fixing assembly	Lower fixing roller	△				Use cleaning oil.
	Separation claw (lower)	△				Use solvent.
	Fixing inlet guide	△				
Delivery assembly	Delivery guide/ tray	△				
	Delivery spacer	△				

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Code	Cause	Description
E220	• Scanning lamp (faulty) • Composite power supply (faulty) • DC controller (faulty)	• The lamp is identified as being on during standby. • The lamp is identified as being off during copying operation.
E240	• DC controller (faulty) • Composite power supply (faulty)	A communication error is detected between the CPU (Q301) on the DC controller and the CPU (Q512) on the composite power supply.
E261	• Power supply frequency (fluctuation) • Composite power supply (faulty)	The intervals of the zero cross signal is outside the tolerance.
E710	• DC controller (faulty)	The IPC (Q104) cannot be initialized at power-on.
E711	• DC controller (faulty)	An IPC communication error has been detected twice within 1 sec.
E712	• DC controller (faulty) • DF controller (faulty) • Connector (poor contact)	An error in communication with the DF cannot be cleared.
E717	• DC controller (faulty) • ASSIST controller (faulty) • Communication (with ASSIST)	• A communication with ASSIST has been successfully but failed in the middle. • An open circuit is detected on the line with ASSIST.

Table 3-801-3

Clearing an Error Code (back-up data)

When the self diagnosis mechanism has been activated, the copier may be reset by turning its power off and on. However, this does not work for E000, E001, E002, E003, E004, or E007; this arrangement is to prevent the user from causally resetting any of the errors, which could damage the film or the heater in side the fixing assembly.

If E000, E001, E002, E003, E004, or E007 is indicated, remove the cause and clear the back-up data as follows:

1) Open the front door, and insert the door switch actuator.
2) Press the power switch while holding down the service mode switch (SW302) on the DC controller with a hex key.
3) The power should go off in about 2 sec; turn on the power.

Caution:
Detection of E000, E001, E002, E003, or E004 automatically turns off the copier. To check the type of error in service mode, go through the above steps after disconnecting the fixing heater.

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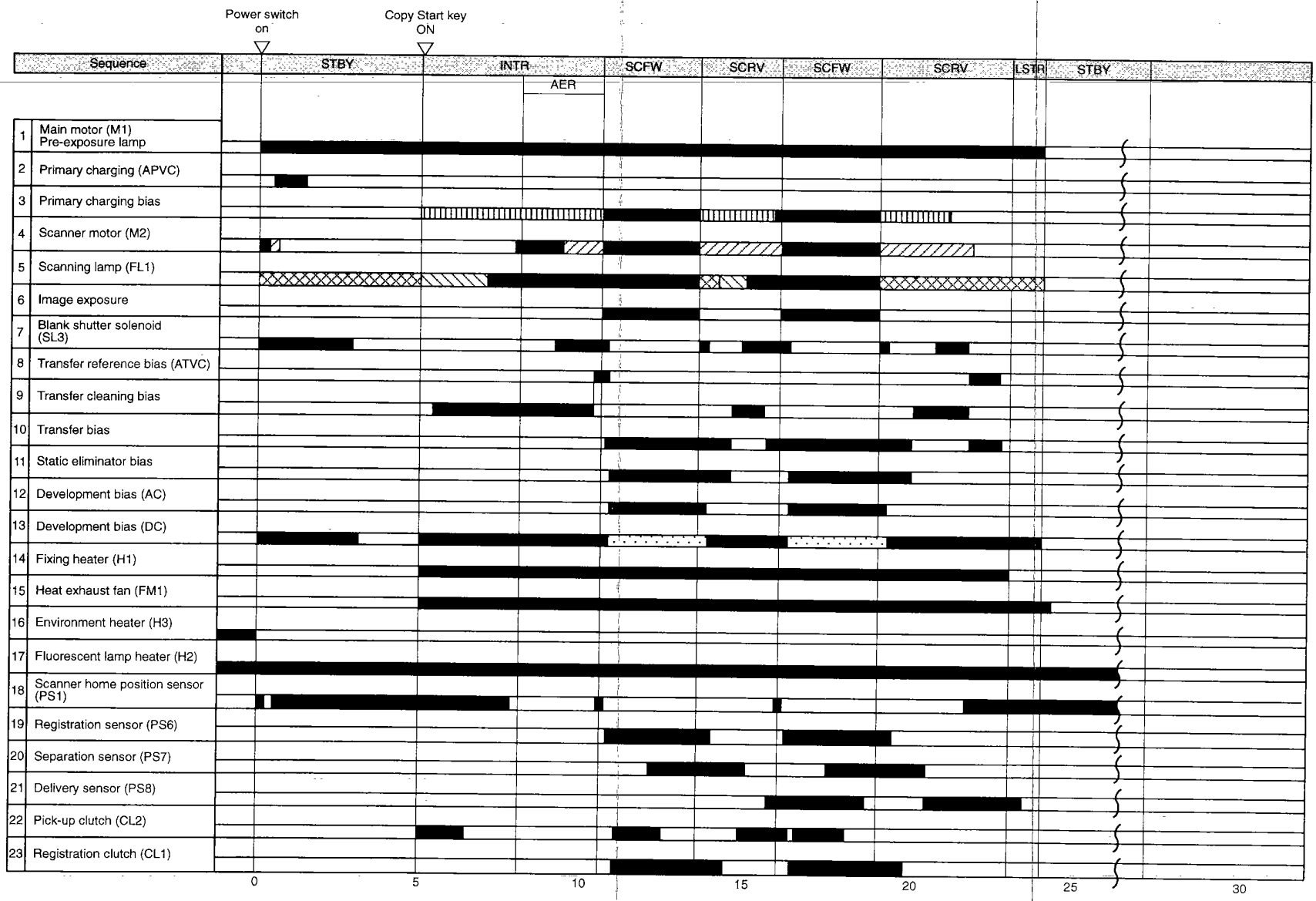
A. GENERAL TIMING CHART

(A4, 2 copies, Direct, from copier cassette)



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B. SIGNALS AND ABBREVIATIONS

1. Signals and Abbreviations

ACBIAS	DEVELOPING AC BIAS VOLTAGE DETECTION signal
AE	AE SENSOR OUTPUT signal AE
AEREF	AE SENSOR REFERENCE signal AE
ATTH	AMBIENT TEMPERATURE THERMISTOR signal
BIASS	DEVELOPING DC BIAS VOLTAGE DETECTION signal
BPWM	DEVELOPING BIAS DRIVE command
BSHP	BLANKING SHUTTER HOME POSITION signal
BSSLD	BLANKING SHUTTER SOLENOID DRIVE command
C2PUCLD	CASSETTE2 PICK-UP CLUTCH DRIVE command
C2SZ-1	CASSETTE2 SIZE signal
C2SZ-2	CASSETTE2 SIZE signal
C2SZ-3	CASSETTE2 SIZE signal
C2SZ-4	CASSETTE2 SIZE signal
C2PD	CASSETTE2 PAPER DETECTION signal
C2VPD	CASSETTE2 VERTICAL PATH PAPER DETECTION signal
C3PD	CASSETTE3 PAPER DETECTION signal
C3PUCLD	CASSETTE3 PICK-UP CLUCTH DRIVE command
C3SZ-1	CASSETTE3 SIZE signal
C3SZ-2	CASSETTE3 SIZE signal
C3SZ-3	CASSETTE3 SIZE signal
C3SZ-4	CASSETTE3 SIZE signal
C3VPD	CASSETTE3 VERTICAL PATH PAPER DETECTION signal
CCD	CONTROL CARD DRIVE command
CCDT	CONTROL CARD DETECTION signal
CDC	COPY DENSITY CORRECTION signal
CHSLD	CHANGE SOLENOID DRIVE command
CMA	CASSETTE UNIT MOTOR PULSE command A
CMA*	CASSETTE UNIT MOTOR PULSE command A*
CMB	CASSETTE UNIT MOTOR PULSE command B
CMB*	CASSETTE UNIT MOTOR PULSE command B
CMD	CASSETTE UNIT MOTOR DRIVE command
CPD	CASSETTE PAPER DETECTION signal
CRDOP	CASSETTE RIGHT DOOR OPEN signal
CS	CASSETTE SIZE DETECTION command
CS2	CASSETTE2 SIZE DETECTION command
CS3	CASSETTE3 SIZE DETECTION command
CSZ-1	CASSETTE SIZE signal 1
CSZ-2	CASSETTE SIZE signal 2
CSZ-3	CASSETTE SIZE signal 3
CSZ-4	CASSETTE SIZE signal 4
DPD	DELIVERY PAPER DETECTION signal
EHTRL	EARTH RL DRIVE command RL2
FFA	FUSER FILM MOTOR PULSE command A
FFA*	FUSER FILM MOTOR PULSE command A*
FFB	FUSER FILM MOTOR PULSE command B
FFB*	FUSER FILM MOTOR PULSE command
FFCA	FUSER FILM MOTOR VOLTAGE command A
FFCB	FUSER FILM MOTOR VOLTAGE command B
FFD	FIXING FILM POSITION signal
FLHT OFF	FLUORESCENT LAMP HETER OFF command
FL ON	FLUORESCENT LAMP ON command
FLPRHT	FLUORESCENT LAMP PRE-HEAT command
FLS	FLUORESCENT LAMP INTENSITY signal
FLTH	FLUORESCENT LAMP THERMISTOR signal
FLTH ON	FLUORESCENT LAMP HETER ON command
FMD	FUSER FILM MOTOR DRIVE command
HEFD	HEAT EXHAUST FAN DRIVE command
HTNG	FUSER HEATER NG signal
HTRD	HEATER DRIVE command
JCTL	DISCHARGE BIAS DRIVE command
JLVCTL	DISCHARGE BIAS CHANGE command
LHP	LENS HOME POSITION signal
LID	LIGHT INTENSITY signal
LNSA	LENS MOTOR PULSE command A
LNSA*	LENS MOTOR PULSE command A*
LNSB	LENS MOTOR PULSE command B
LNSB*	LENS MOTOR PULSE command B*
LNSC-A	LENS MOTOR DRIVE command A
LNSC-B	LENS MOTOR DRIVE command B
MFPD	MULTIFEEDER PAPER DETECTION signal
MFPUCLD	MULTIFEEDER PICK-UP CLUTCH DRIVE command
MFPWD	MULTIFEEDER PAPER WIDTH DETECTION signal
MFSLD	MULTIFEEDER SOLENOID DRIVE command
MLOCK	MAIN MOTER LOCK signal
MMCLK	MAIN MOTOR CLOCK signal
MMD	MAIN MOTER DRIVE command
MPWM	MAIN PULSE command
PCLSLD	PRIMARY CORONA ROLLER CLEANING SOLENOID command
PDCPWM	PRIMARY CORONA DETECT PULSE command
PDCS	PRIMARY CORONA DETECT command
PEXP	PRE-EXPOSURE LAMP LIT command
PUCLD	PICK-UP CLUTCH DRIVE command
PWSW	POWER SWITCH command
RDOP	RIGHT DOOR OPEN signal
RGCLD	REGISTRATION CLUTCH DRIVE command
RPD	REGISTRATION PAPER DETECTION signal
SC-A	SCANNER MOTOR PULSE command A
SC-A*	SCANNER MOTOR PULSE command A*
SC-B	SCANNER MOTOR PULSE command B
SC-B*	SCANNER MOTOR PULSE command B*
SC-COMA	SCANNER MOTOR DRIVE command A
SC-COMB	SCANNER MOTOR DRIVE command B
SCHP	SCANNE HOME POSITION signal
SPD	SEPARATION PAPER DETECTION signal
SRSW	SERVICE MODE SWITCH signal
TCNTD	TOTAL COUNTER DRIVE command
TEP	TONER EMPTY signal
TFWON	TRNSFER BIAS ON/OFF command
TFWPWM	TRNSFER BIAS LOW VOLTAGE signal
TFWS	TRNSFER BIAS PULSE command
TH 1	FIXING MAIN THERMISTOR signal
TH 2	FIXING SUB THERMISTOR signal
TREVON	TRNSFER REVERSE ON command

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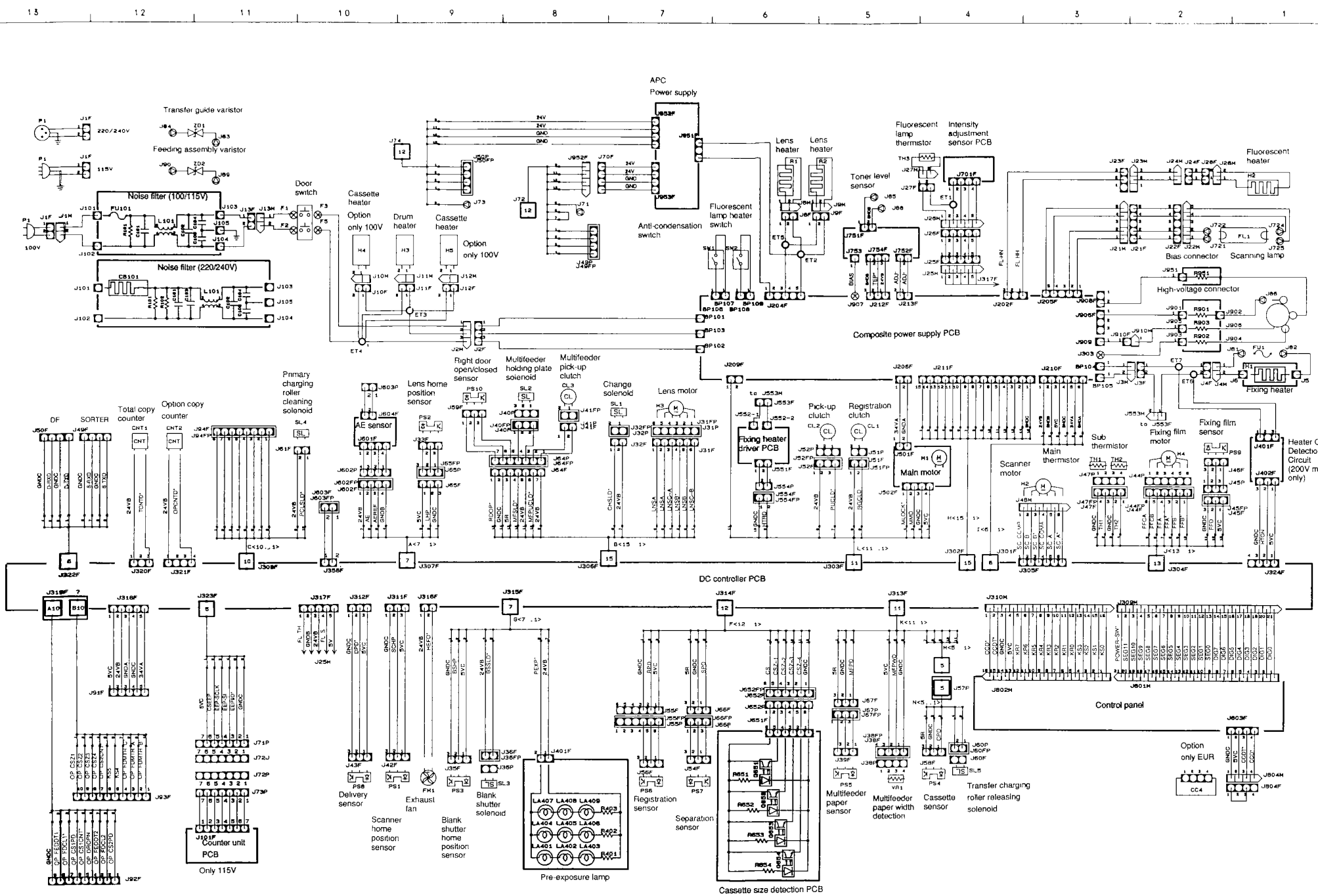
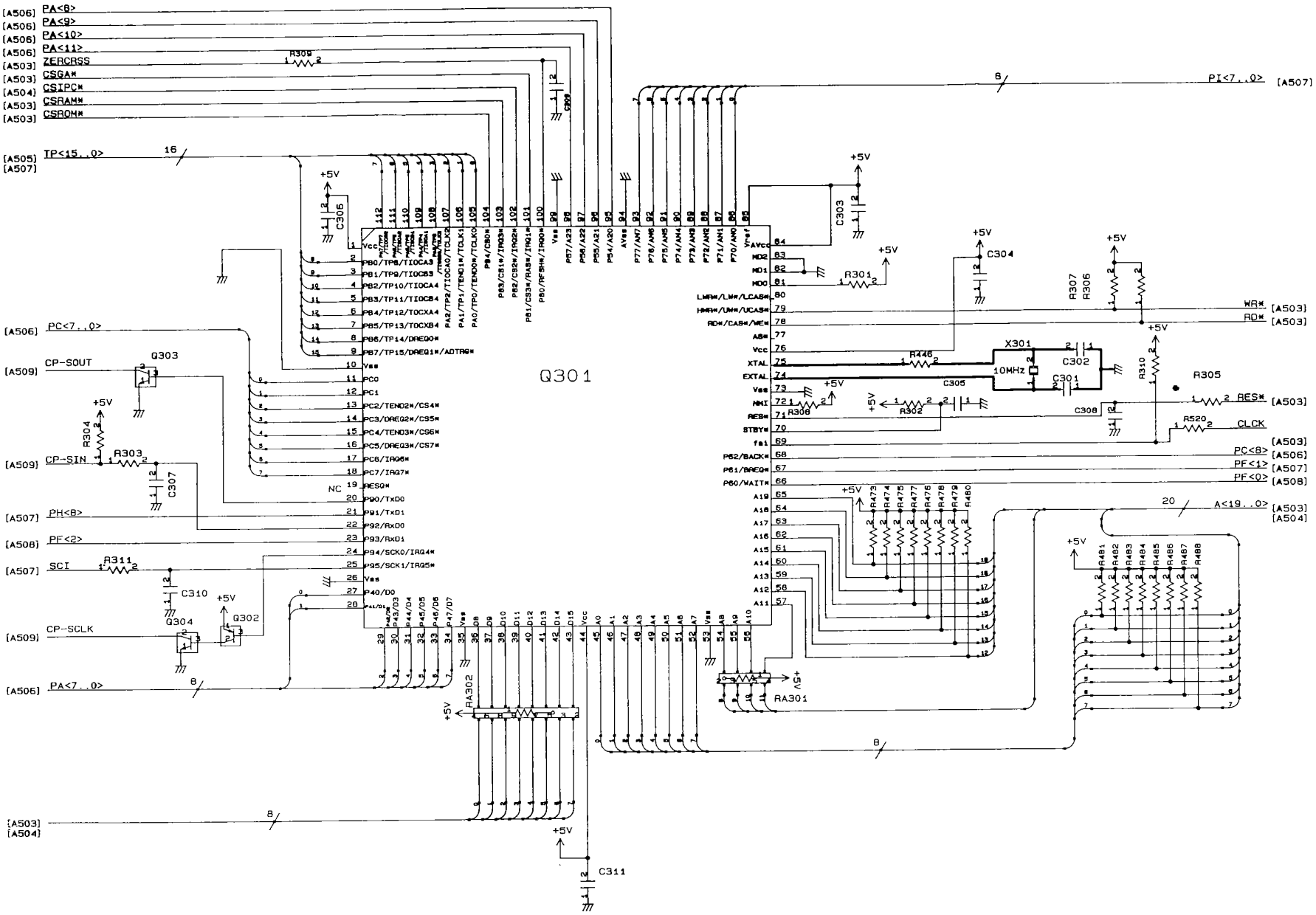

Transfer guide varistor
Feeding assembly varistor
220/240V
115V
Noise filter (100/115V)
Noise filter (220/240V)
Door switch
Cassette heater
Option only 100V
Drum heater
Cassette heater
Option only 100V
APC Power supply
Anti-condensation switch
Fluorescent lamp heater switch
Lens heater
Lens heater
Toner level sensor
Fluorescent lamp thermistor
Intensity adjustment sensor PCB
Fluorescent heater
Bias connector
Scanning lamp
High-voltage connector
Composite power supply PCB
Fixing heater
Heater ON Detection Circuit (200V model only)
Primary charging roller cleaning solenoid
Right door open/closed sensor
Multifeeder holding plate solenoid
Multifeeder pick-up clutch
Change solenoid
Lens motor
Lens home position sensor
AE sensor
DF
SORTER
Total copy counter
Option copy counter
Fixing heater driver PCB
Pick-up clutch
Registration clutch
Main motor
Main thermistor
Sub thermistor
Scanner motor
Fixing film motor
Fixing film sensor
DC controller PCB
Control panel
Option only EUR
Counter unit PCB
Only 115V
Delivery sensor
Scanner home position sensor
Exhaust fan
Blank shutter home position sensor
Blank shutter solenoid
Pre-exposure lamp
Registration sensor
Separation sensor
Cassette size detection PCB
Multifeeder paper sensor
Multifeeder paper width detection
Cassette sensor
Transfer charging roller releasing solenoid



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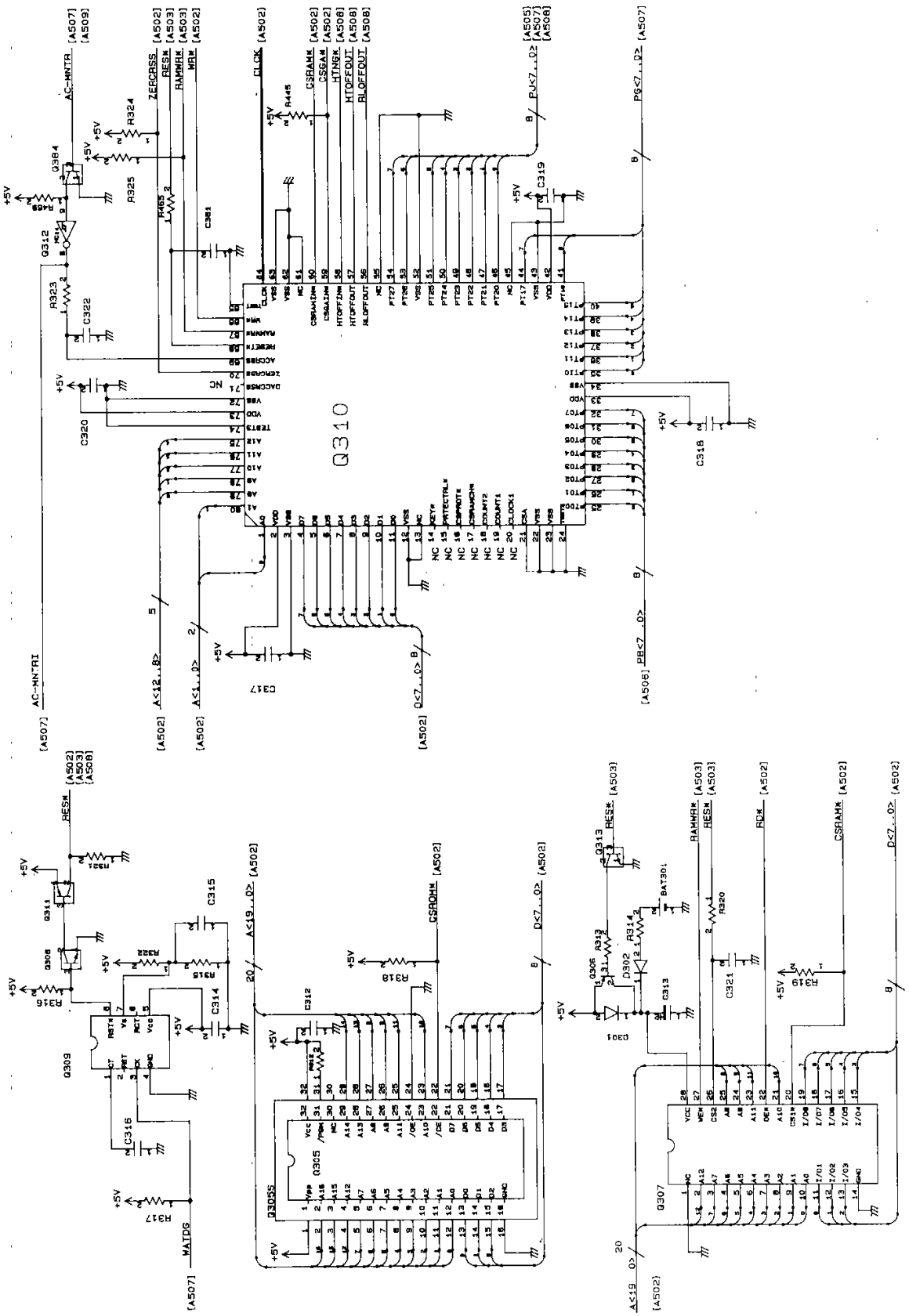
DC Controller (A503) (2/8)



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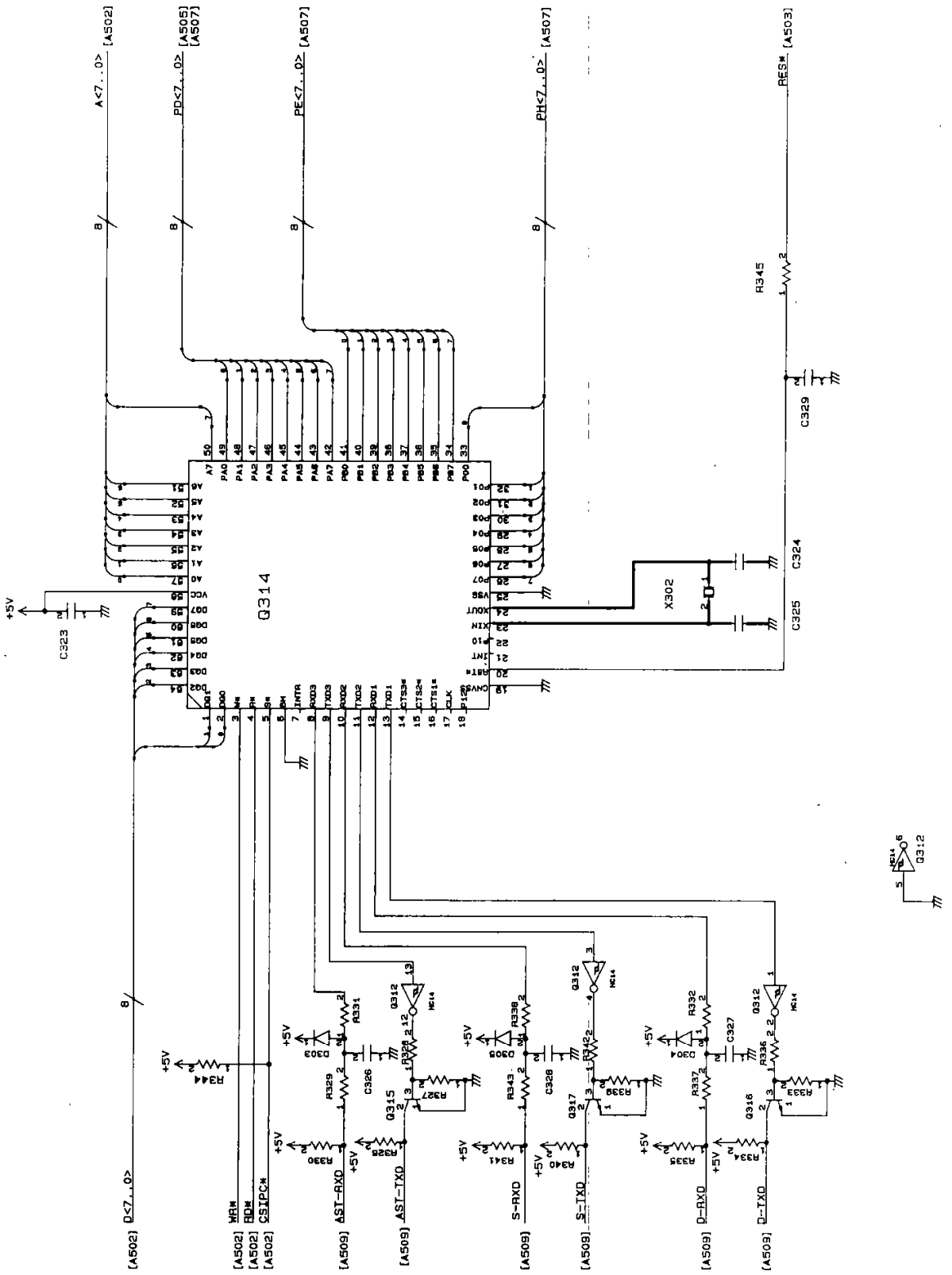
DC Controller (A504) (3/8)



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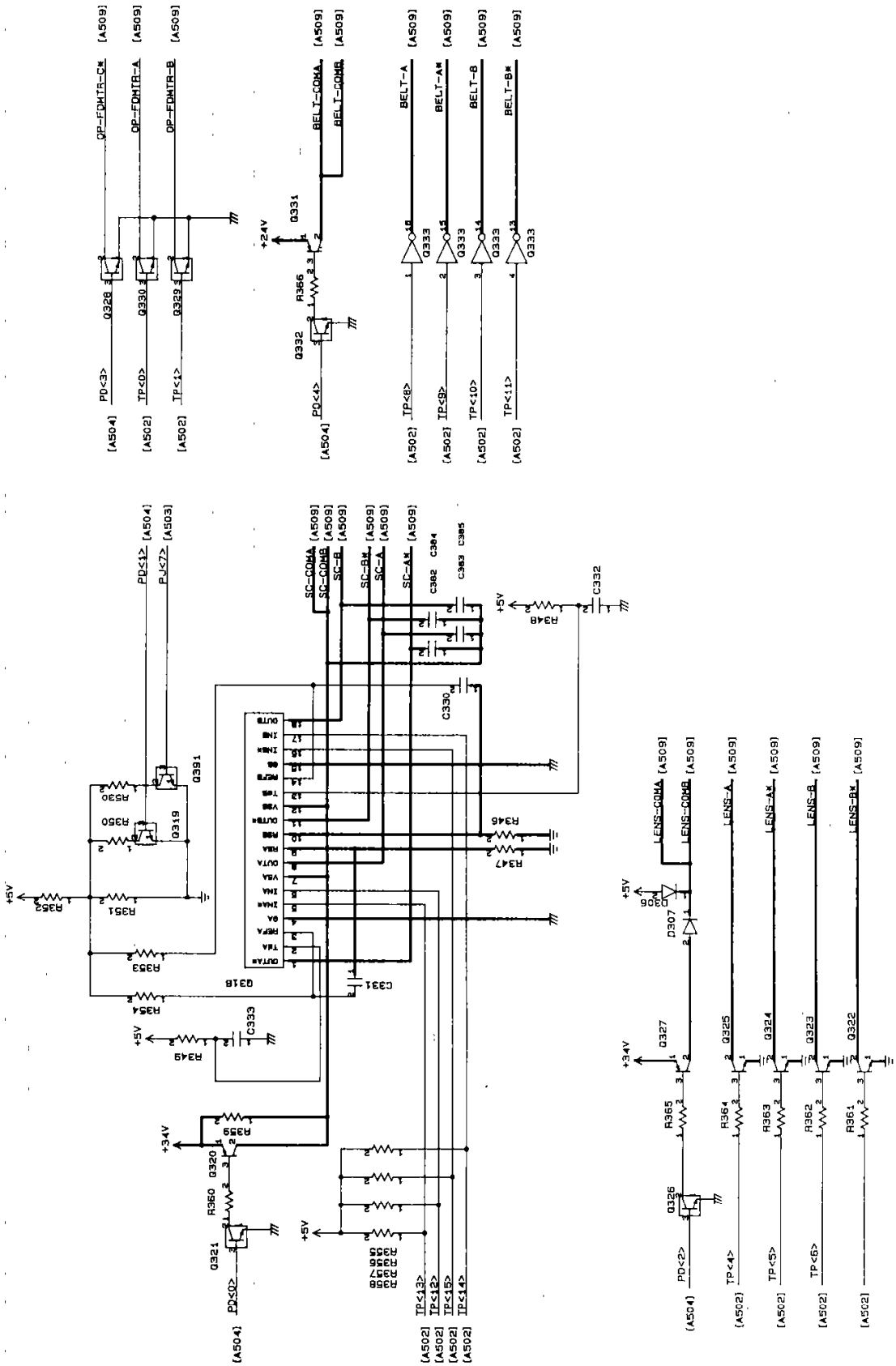
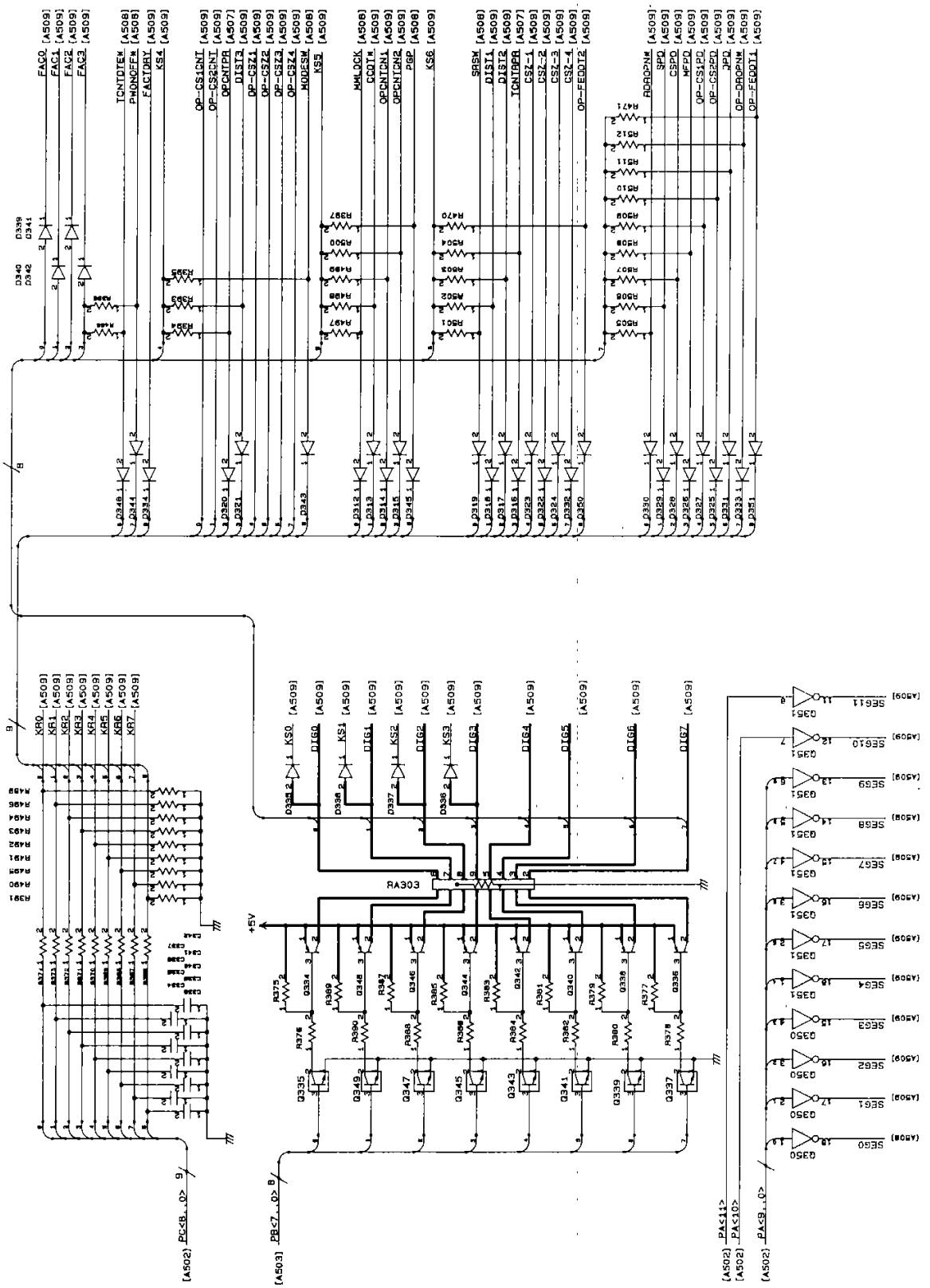
DC Controller (A505) (4/8)



DC Controller (A506) (5/8)



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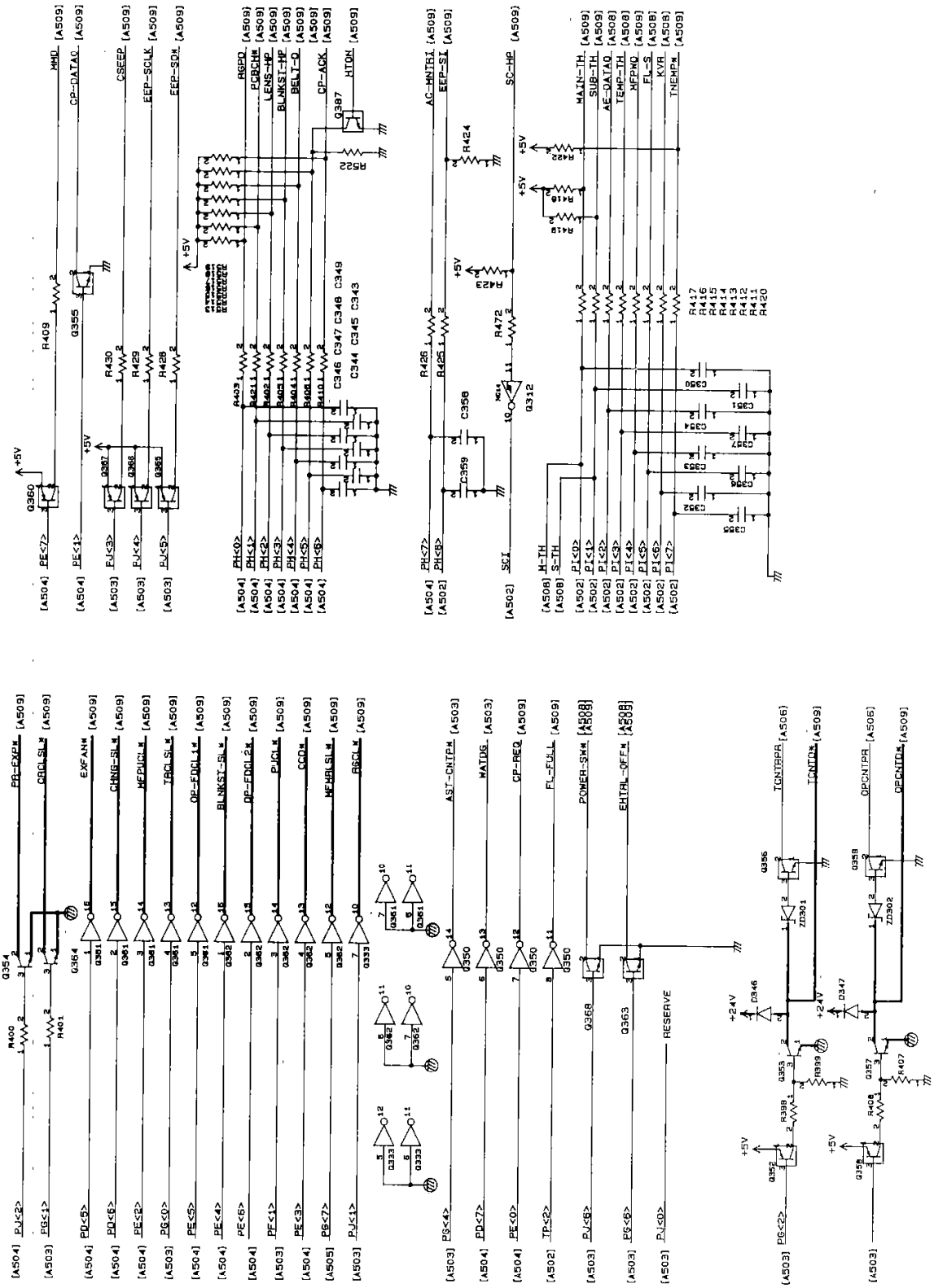
DC Controller (A507) (6/8)



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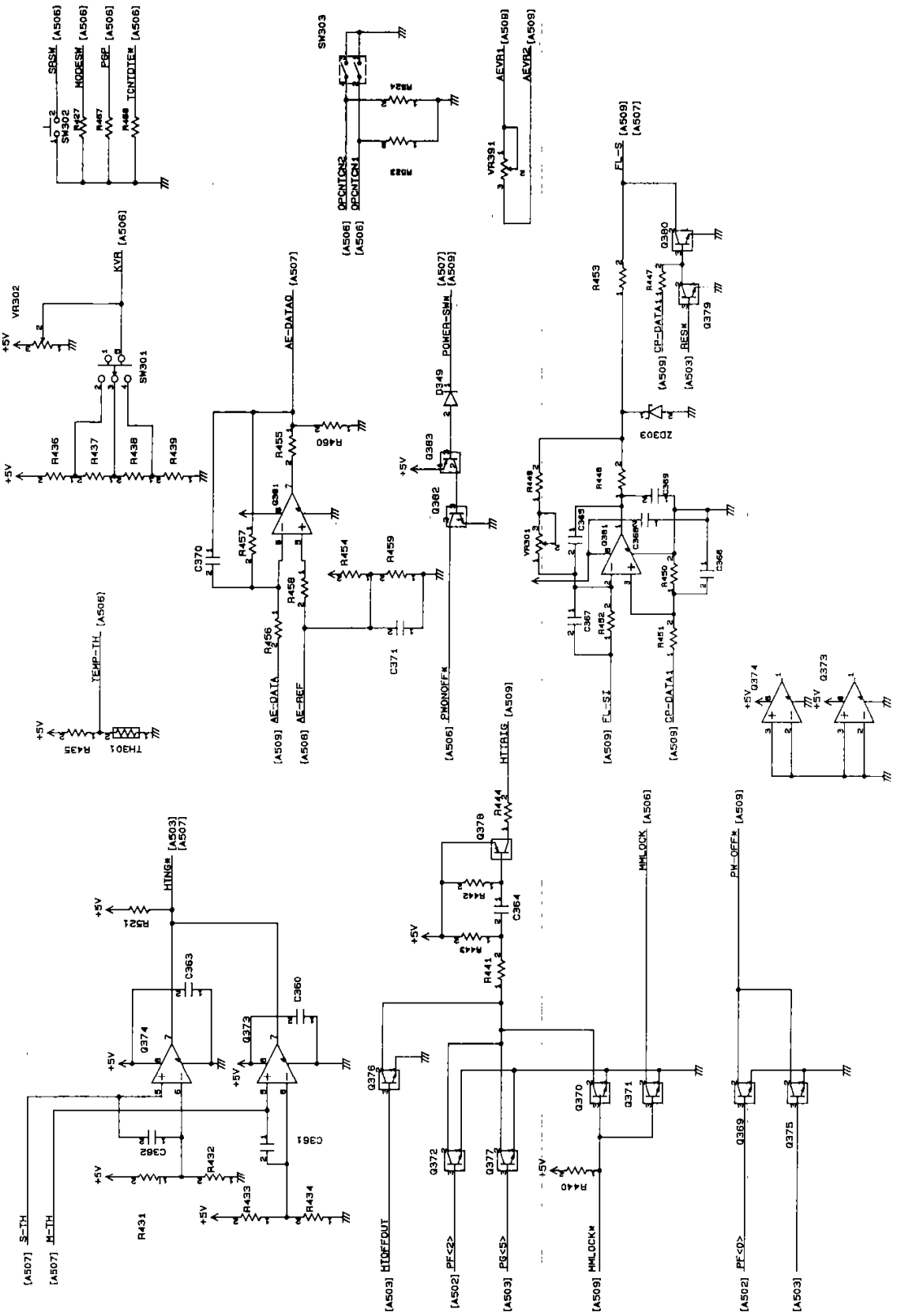
DC Controller (A508) (7/8)



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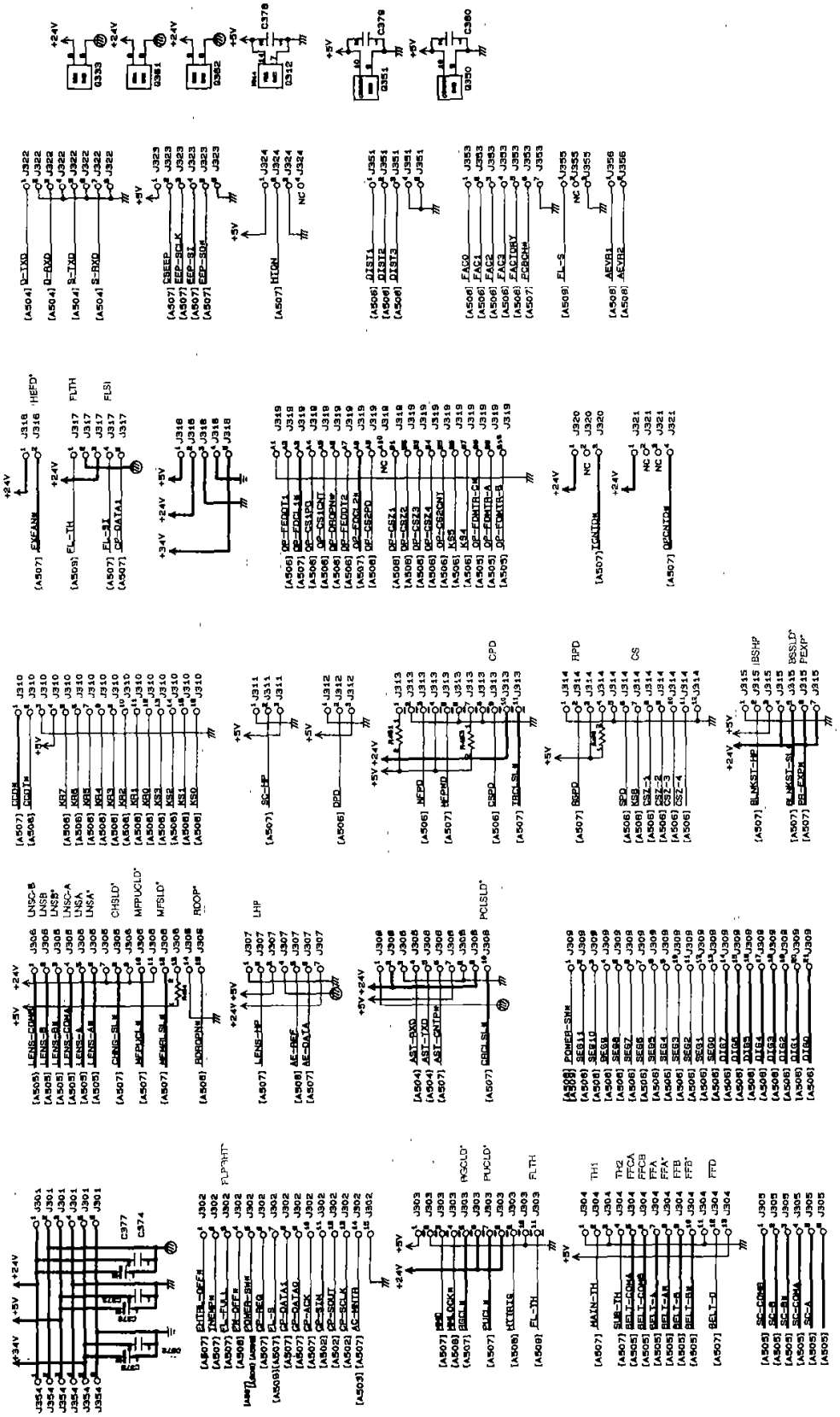
DC Controller (A509) (8/8)



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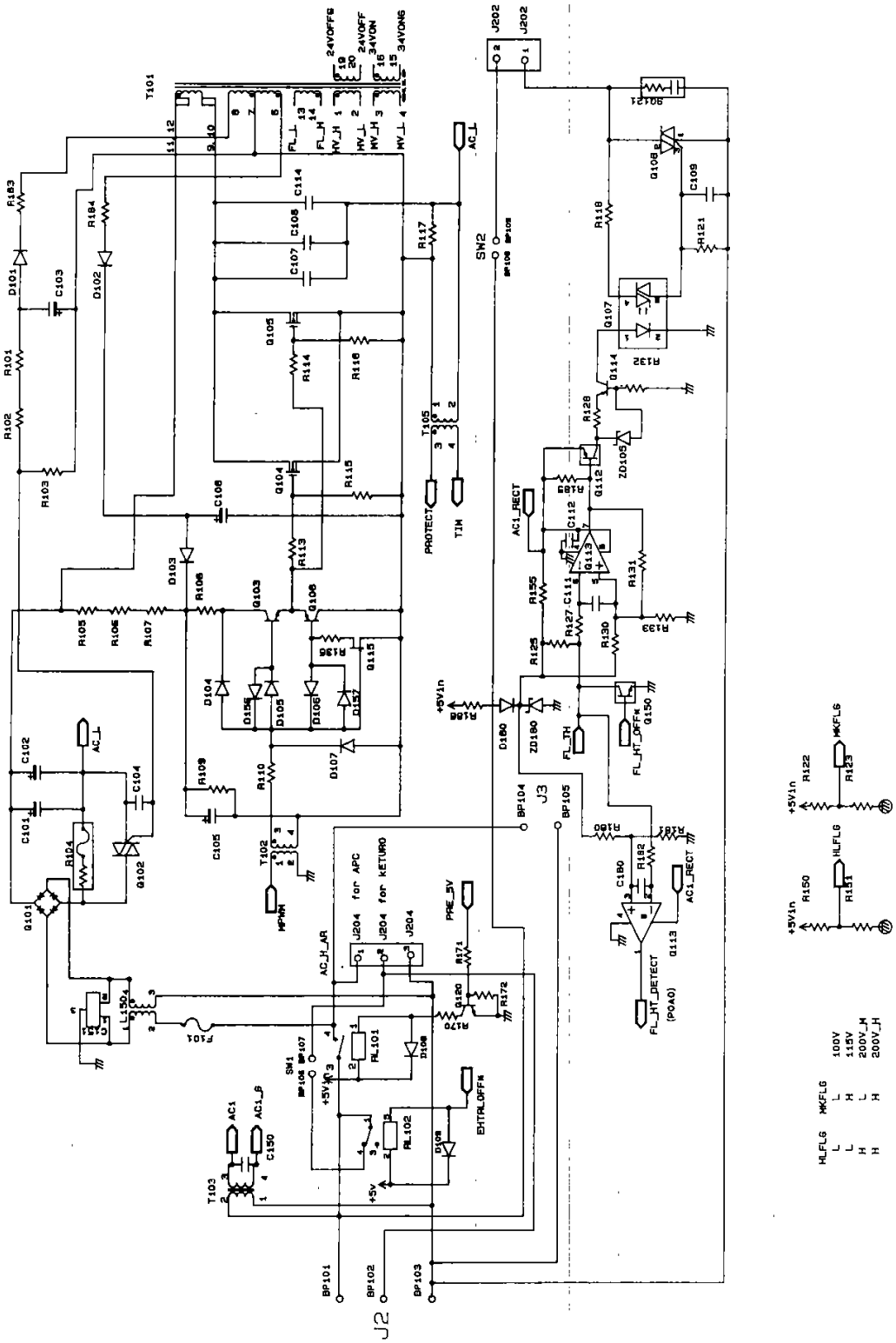
E. COMPOSITE POWER SUPPLY CIRCUIT DIAGRAM

Composite Power Supply PCB (1/5)



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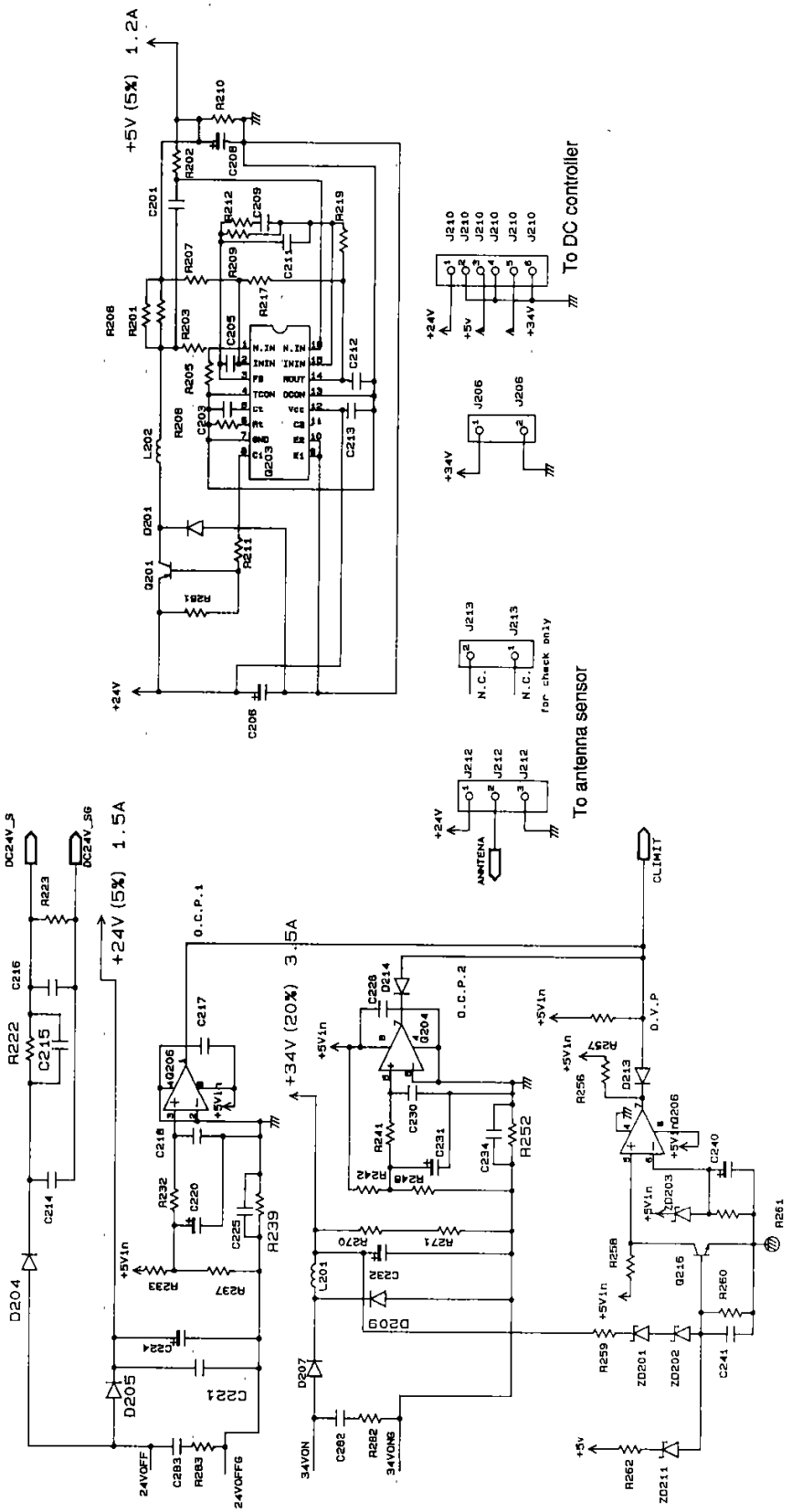
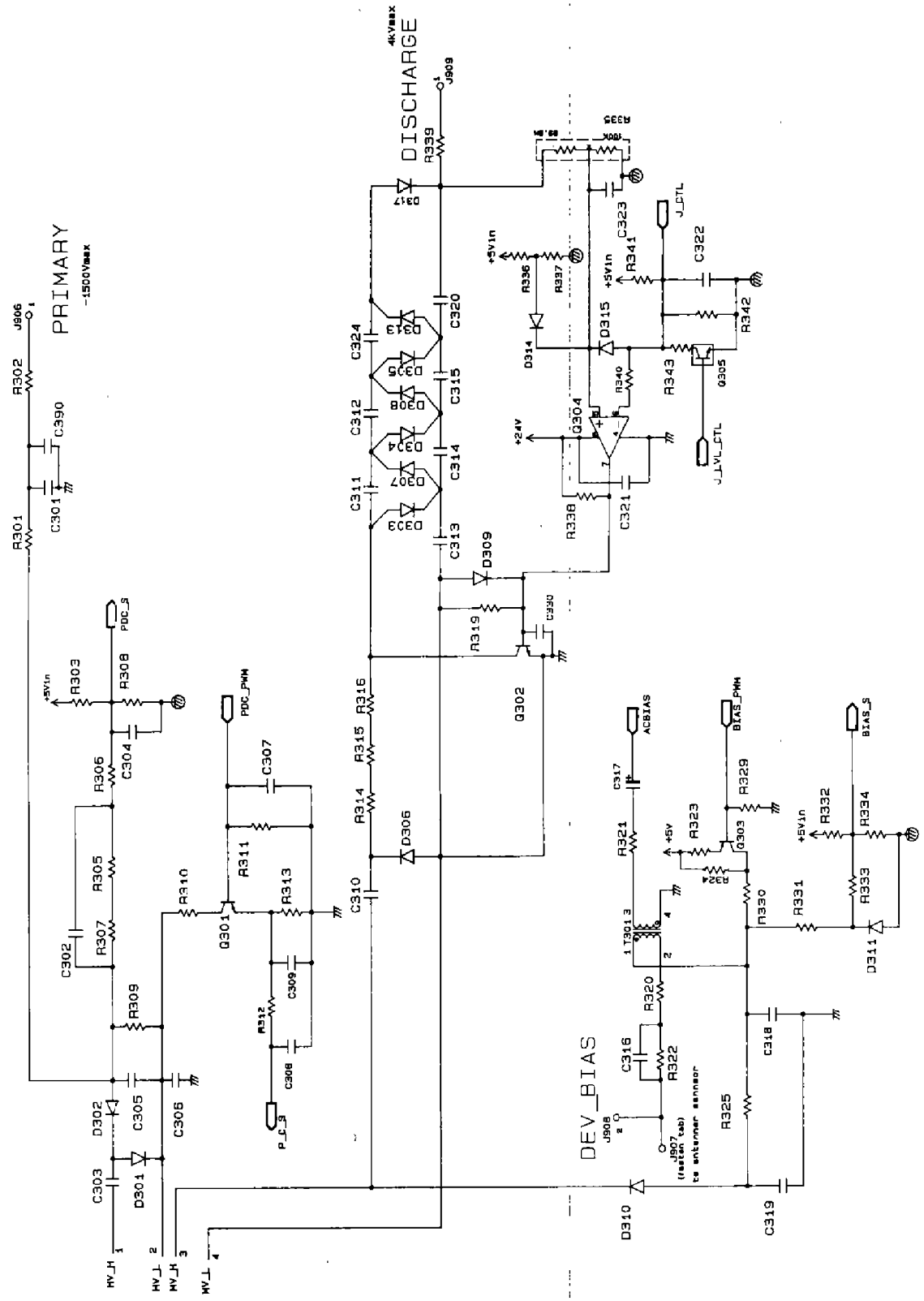
Composite Power Supply PCB (2/5)



Composite Power Supply PCB (3/5)



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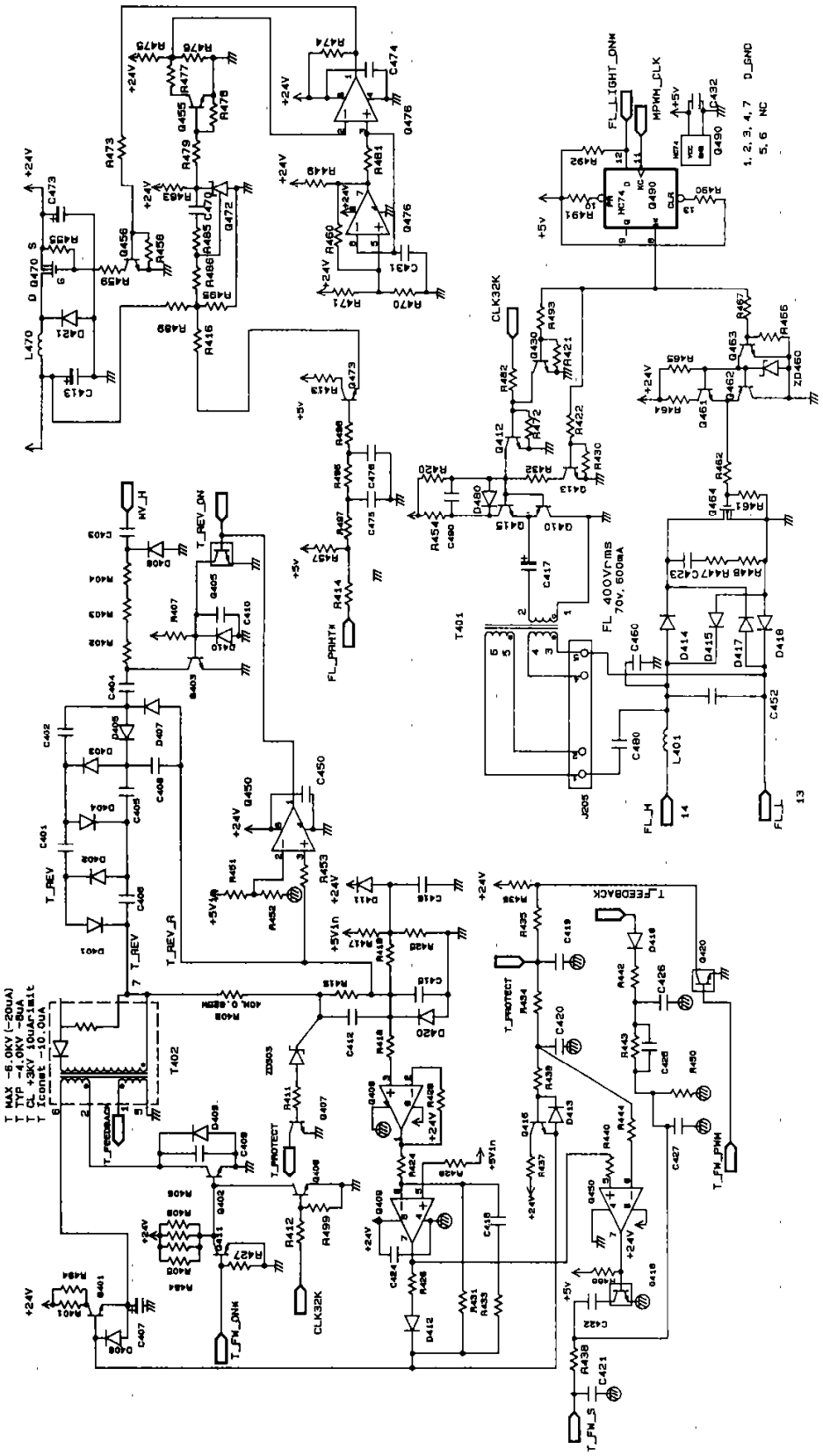
Composite Power Supply PCB (4/5)



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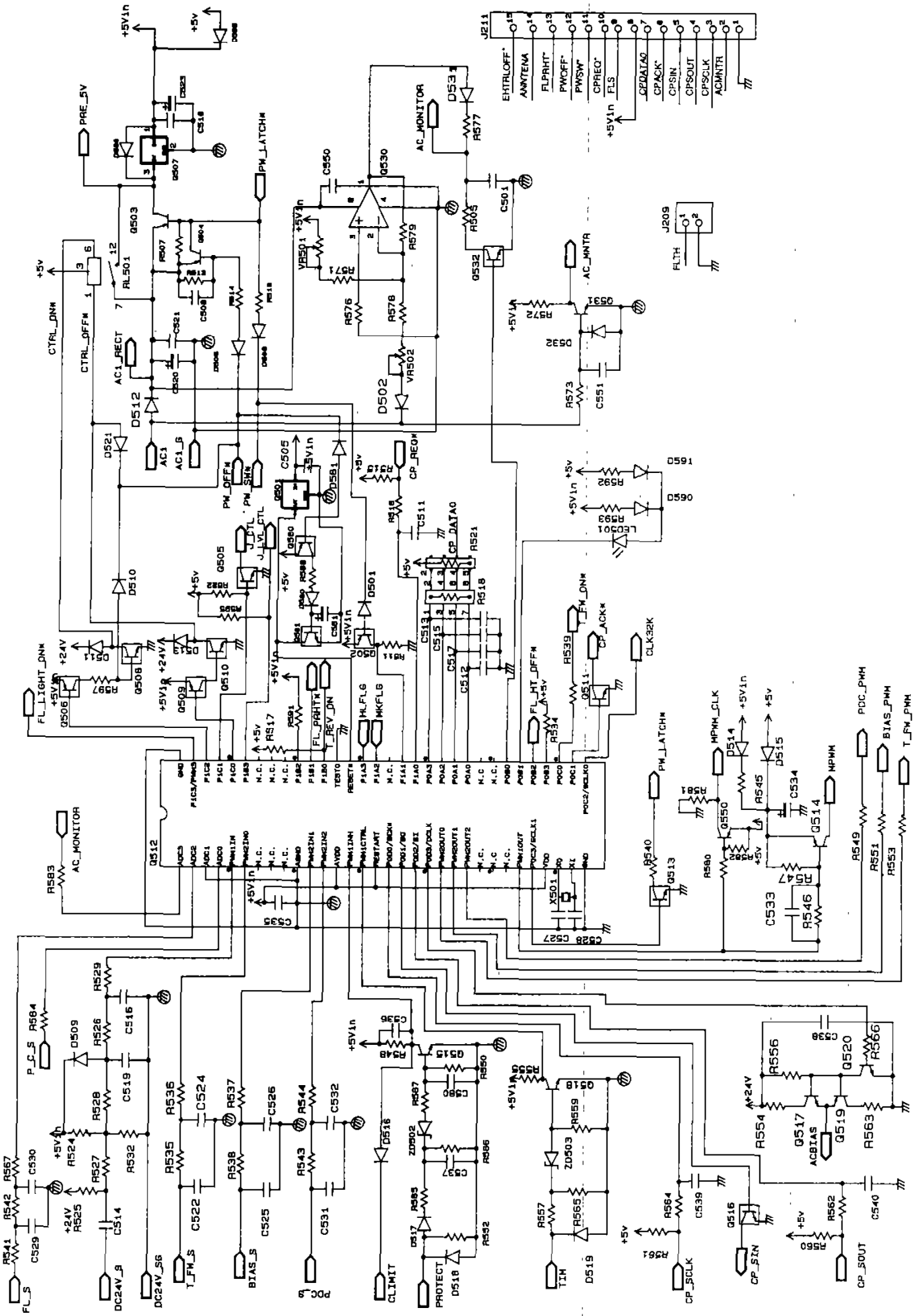
Composite Power Supply PC



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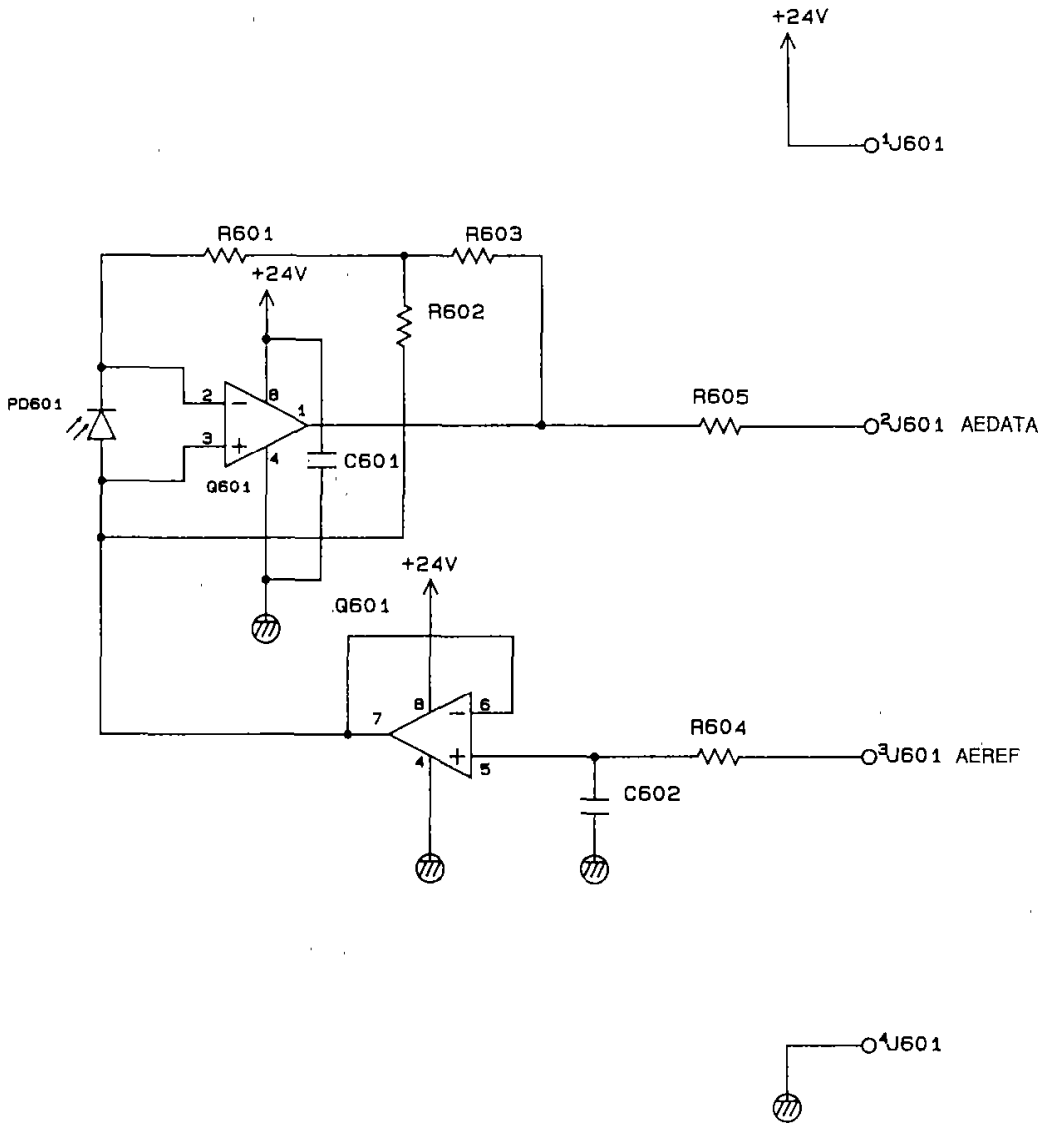
F. AE SENSOR CIRCUIT DIAGRAM



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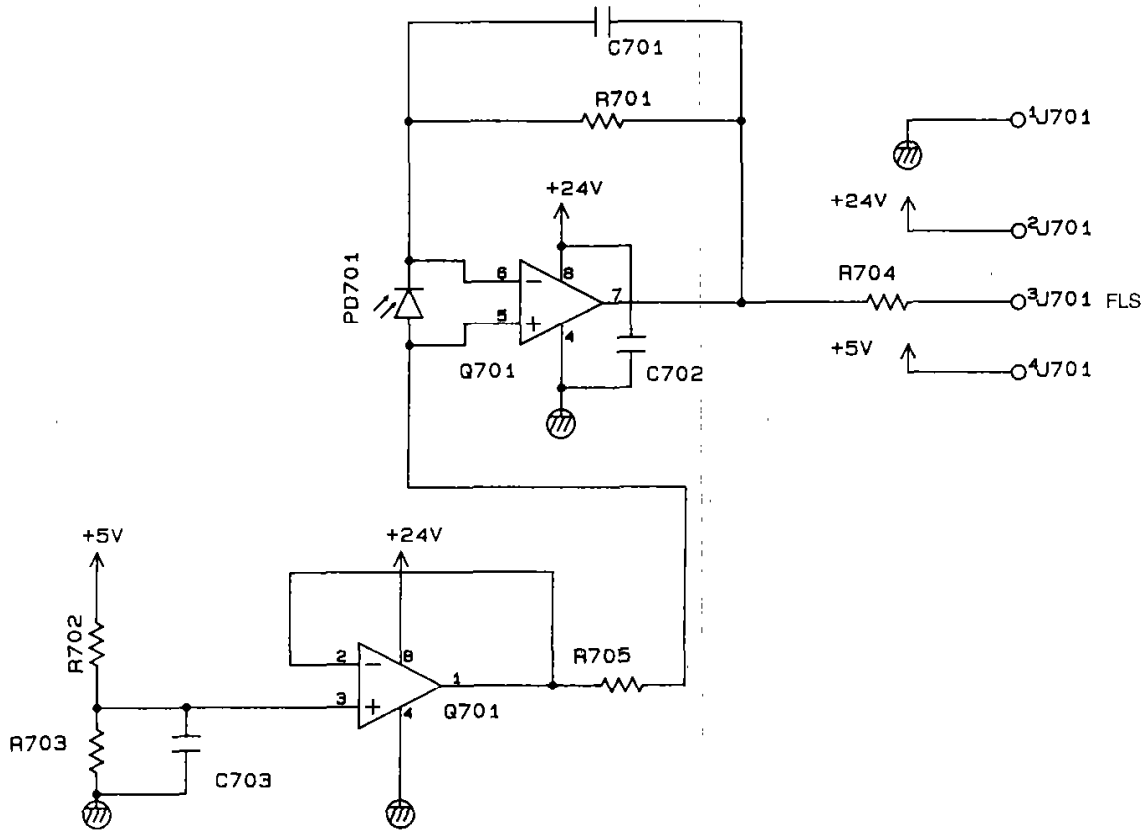
G. INTENSITY SENSOR CIRCUIT DIAGRAM



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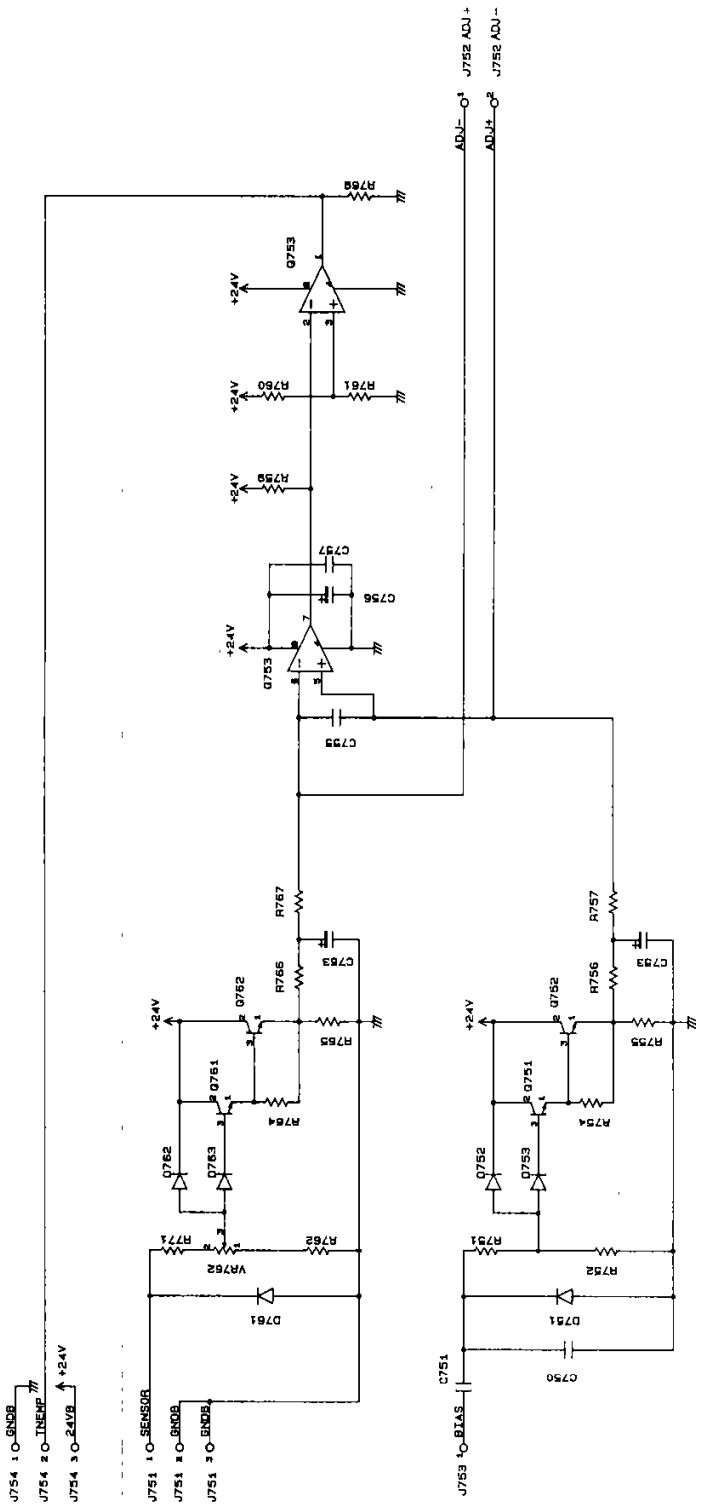
H. TONER LEVEL DETECTION CIRCUIT DIAGRAM



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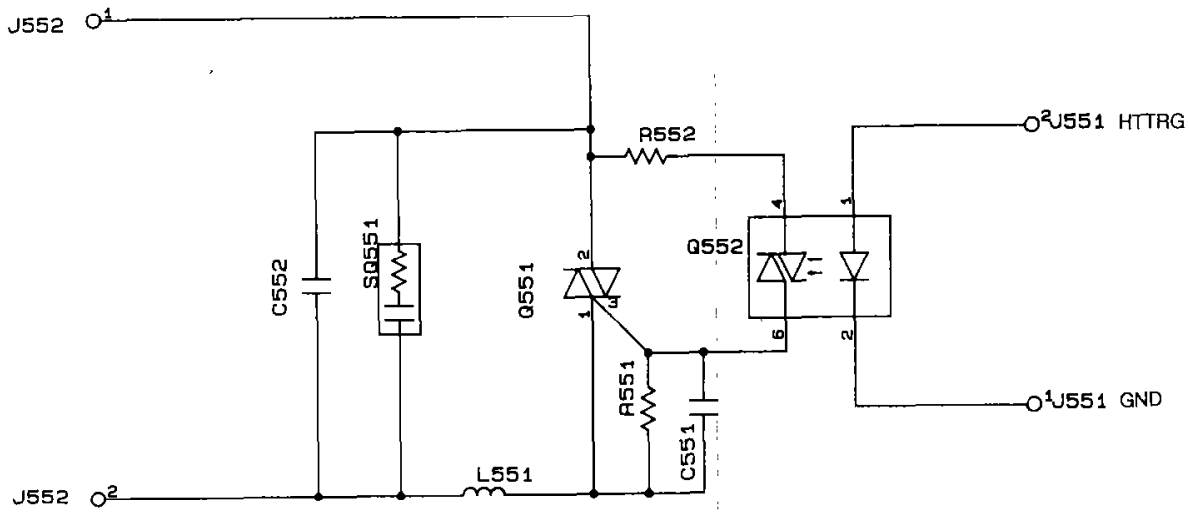
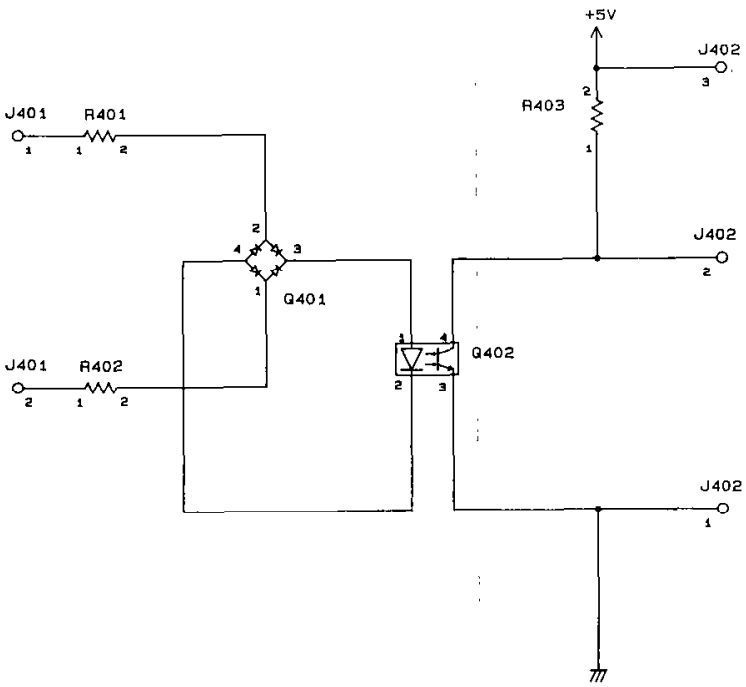
I. FIXING DRIVER CIRCUIT DIAGRAM



J. HEATER ON DETECTION CIRCUIT (200V MODEL ONLY)



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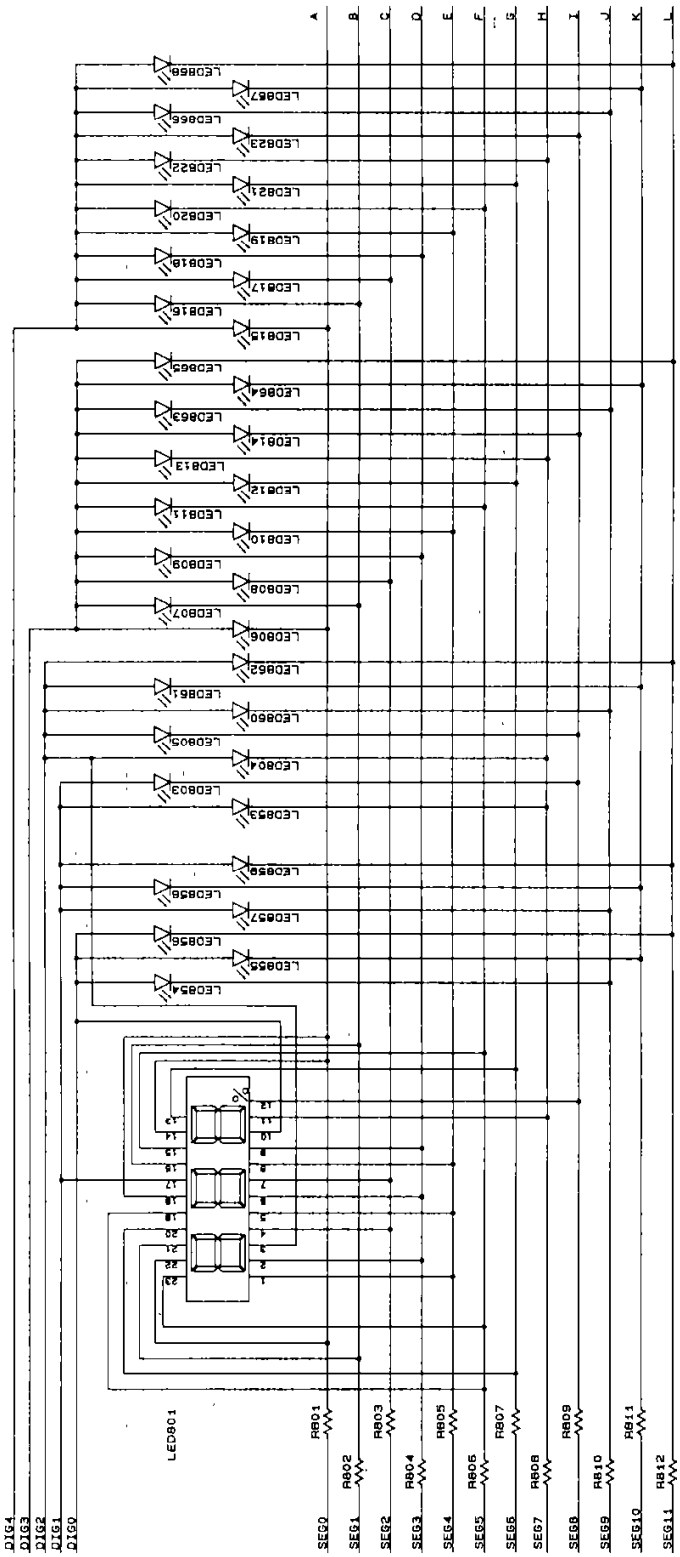
K. CONTROL PANEL CIRCUIT DIAGRAM

Control Panel (1/3)



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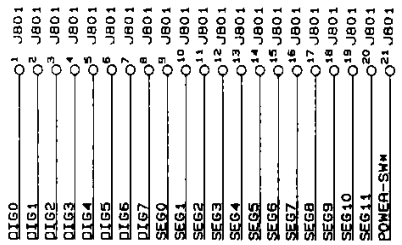
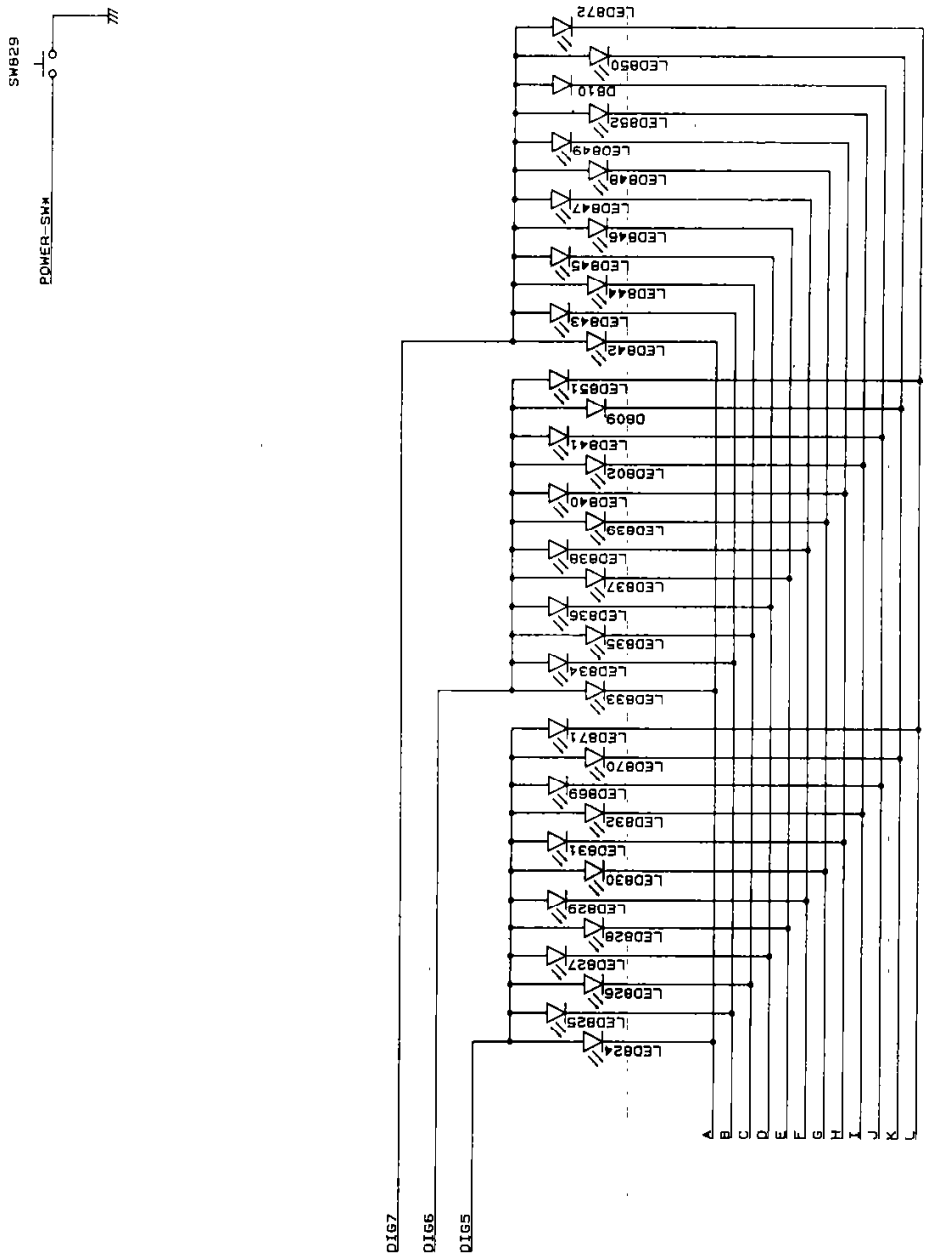
Control Panel (2/3)





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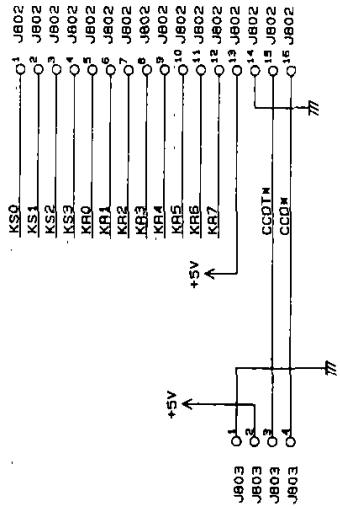
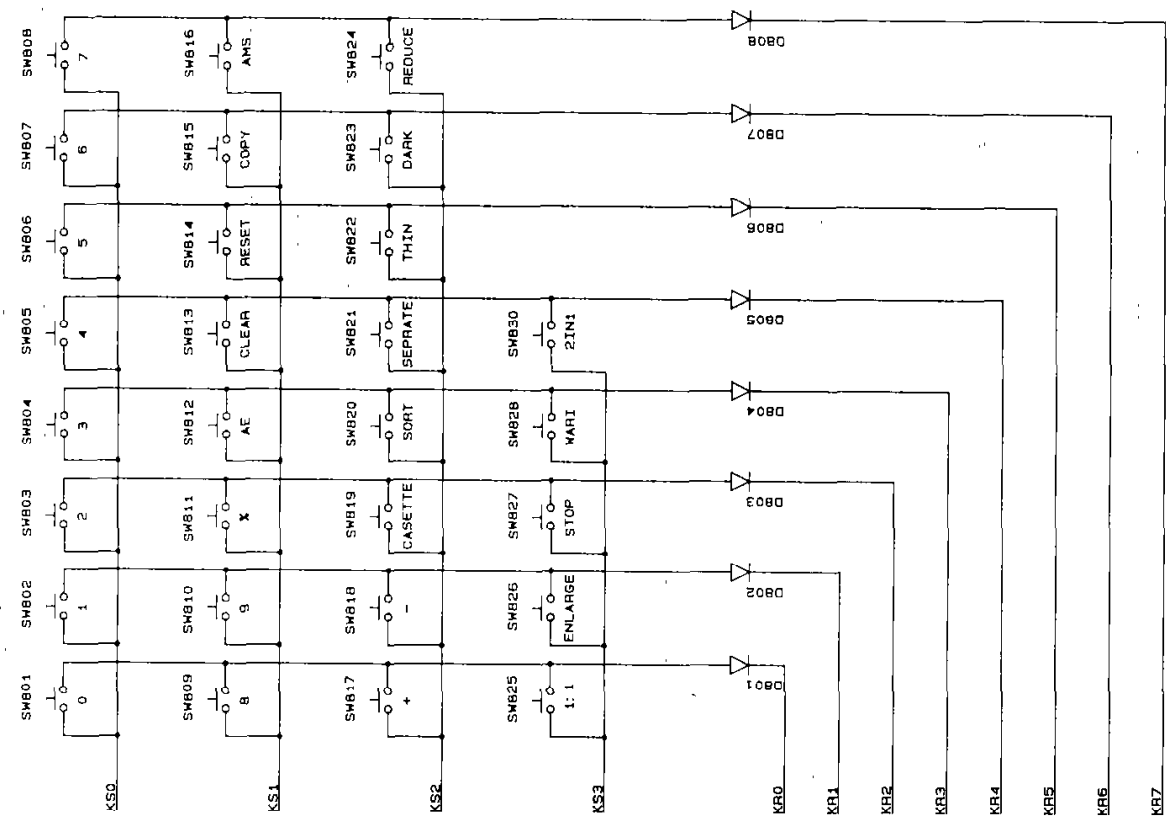
Control Panel (3/3)





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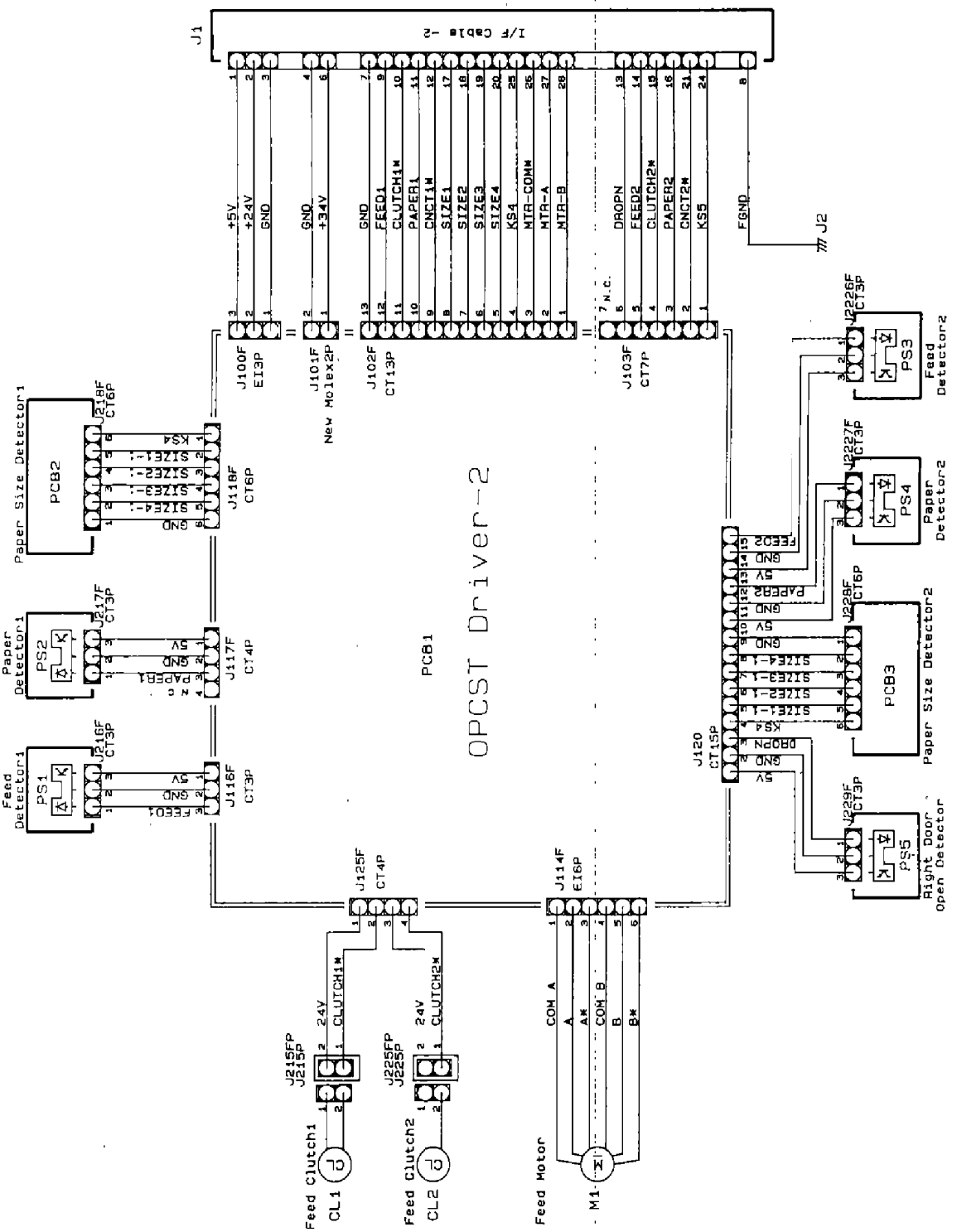
L. CASSETTE FEEDING MODULE-B1 GENERAL CIRCUIT DIAGRAM



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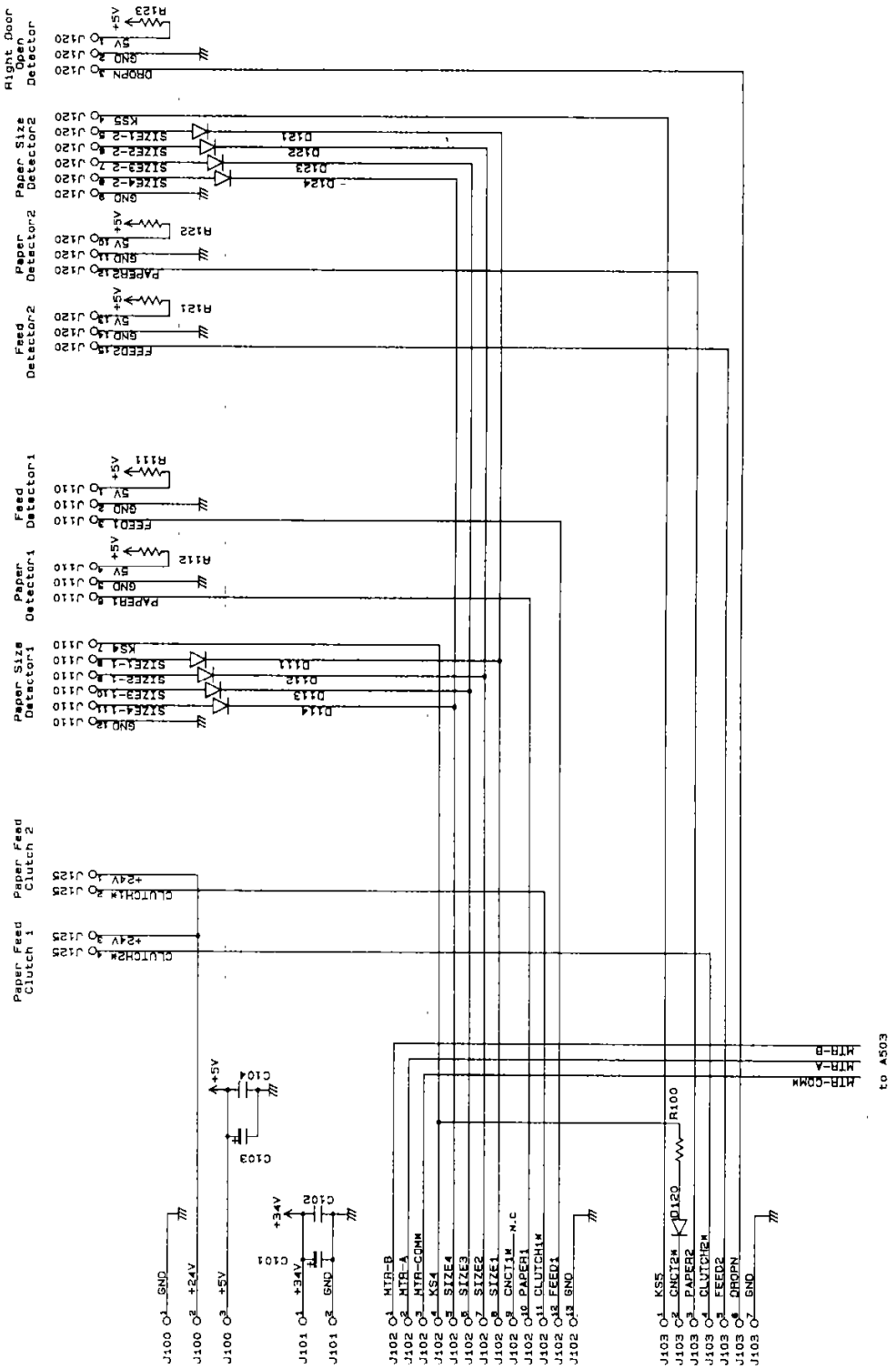
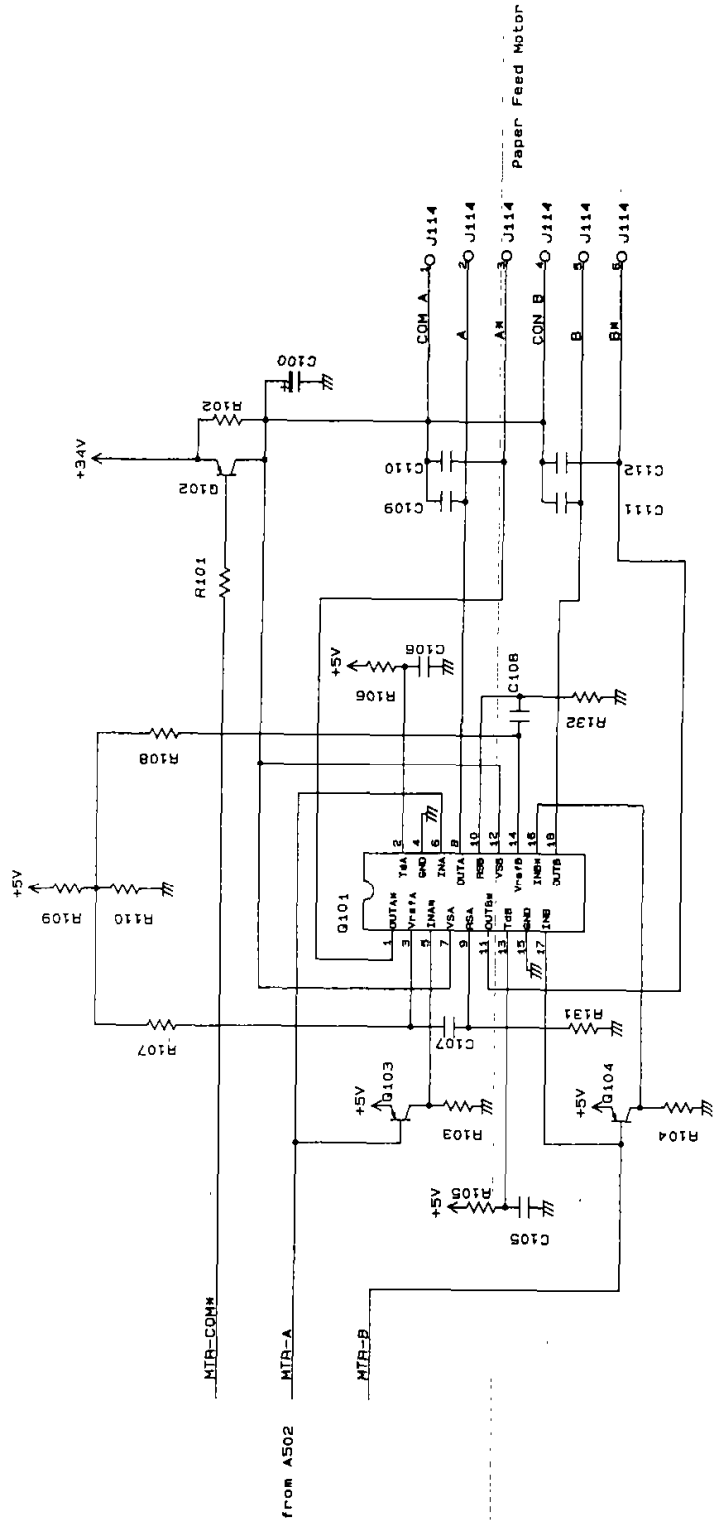
M. CASSETTE FEEDING MODULE-B1

Driver Circuit Diagram (1/2)



Driver Circuit Diagram (2/2)



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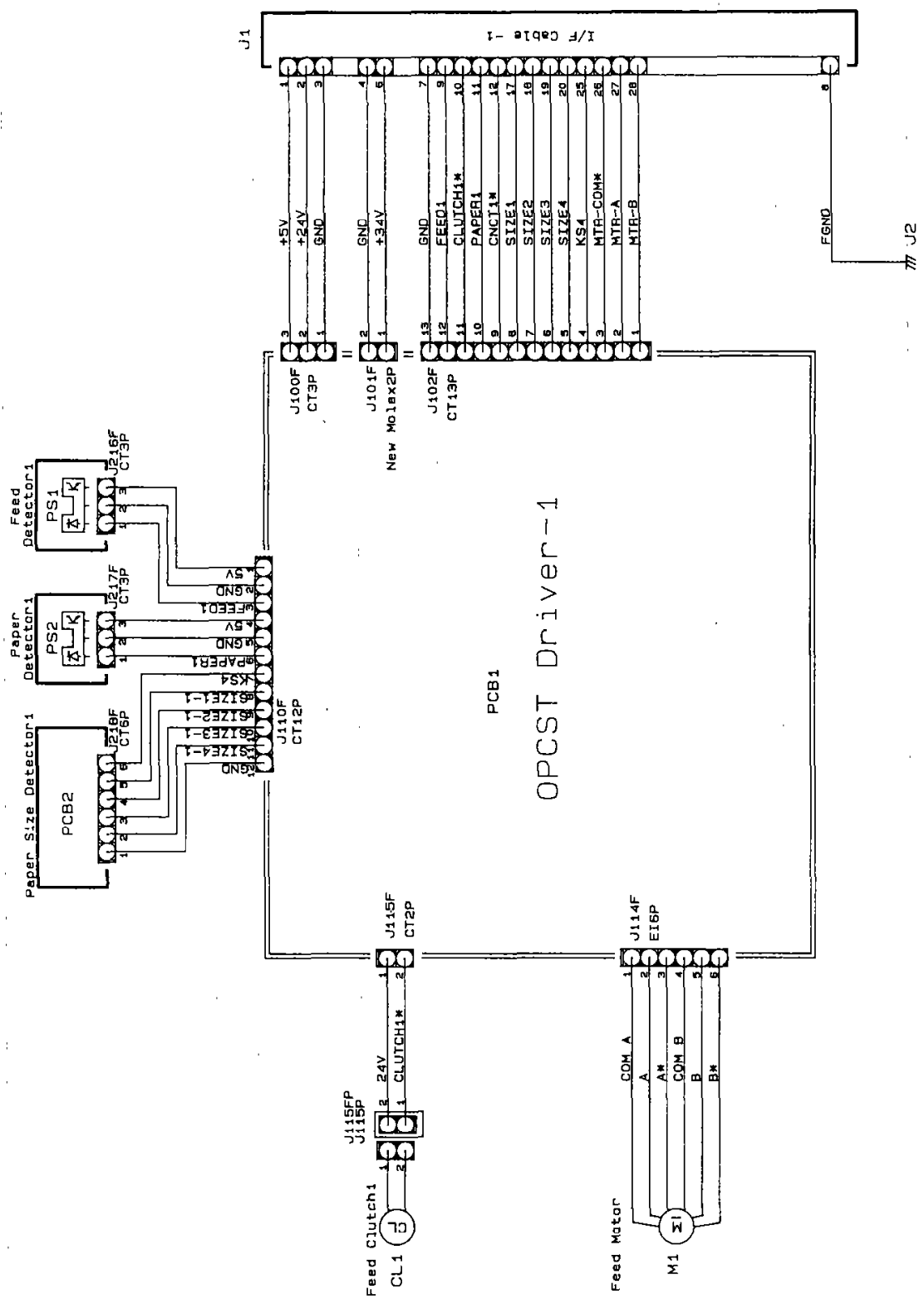
N. CASSETTE FEEDING MODULE-A1 GENERAL CIRCUIT DIAGRAM



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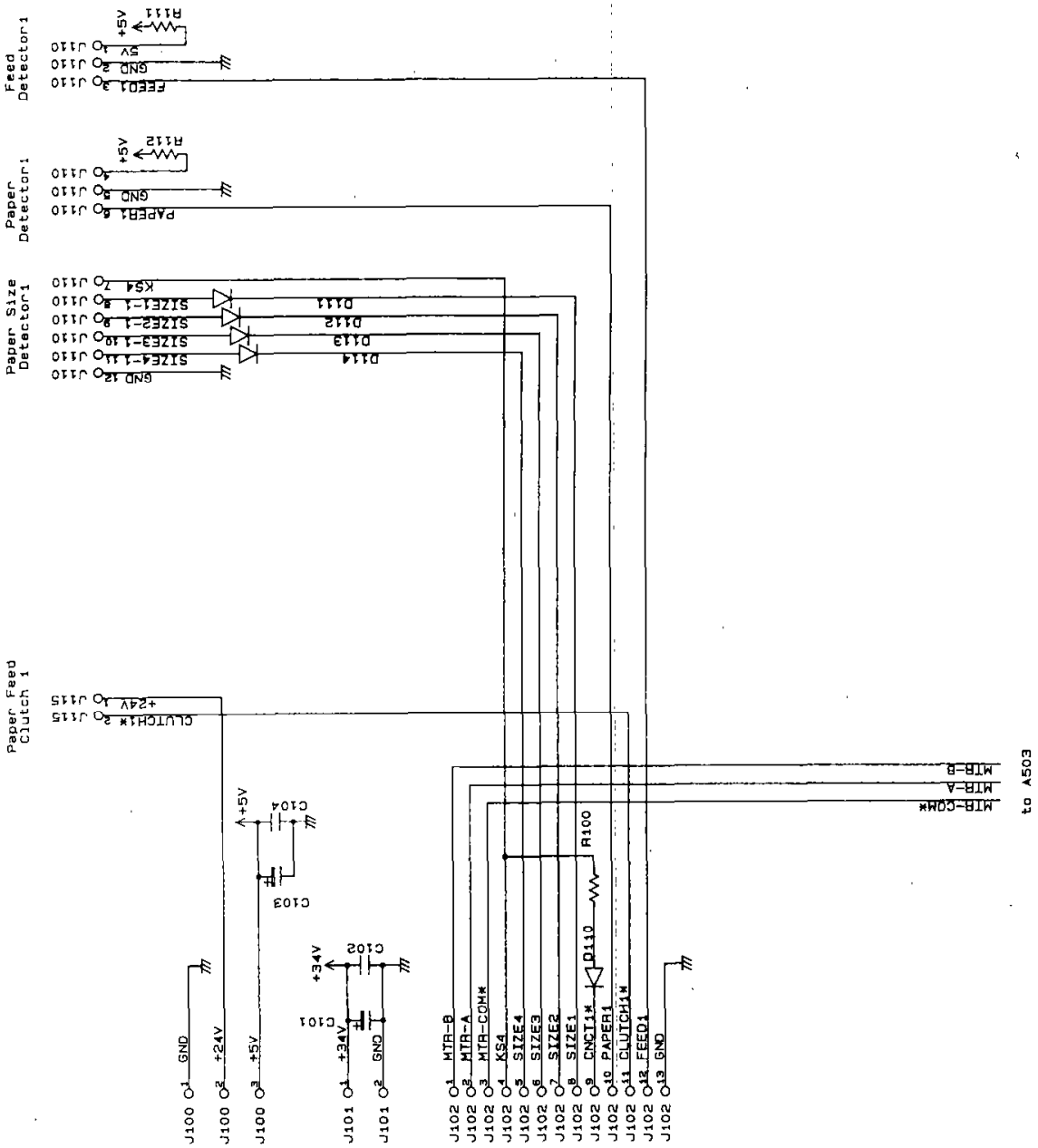
O. CASSETTE FEEDING MODULE-A1

Driver Circuit Diagram (1/2)



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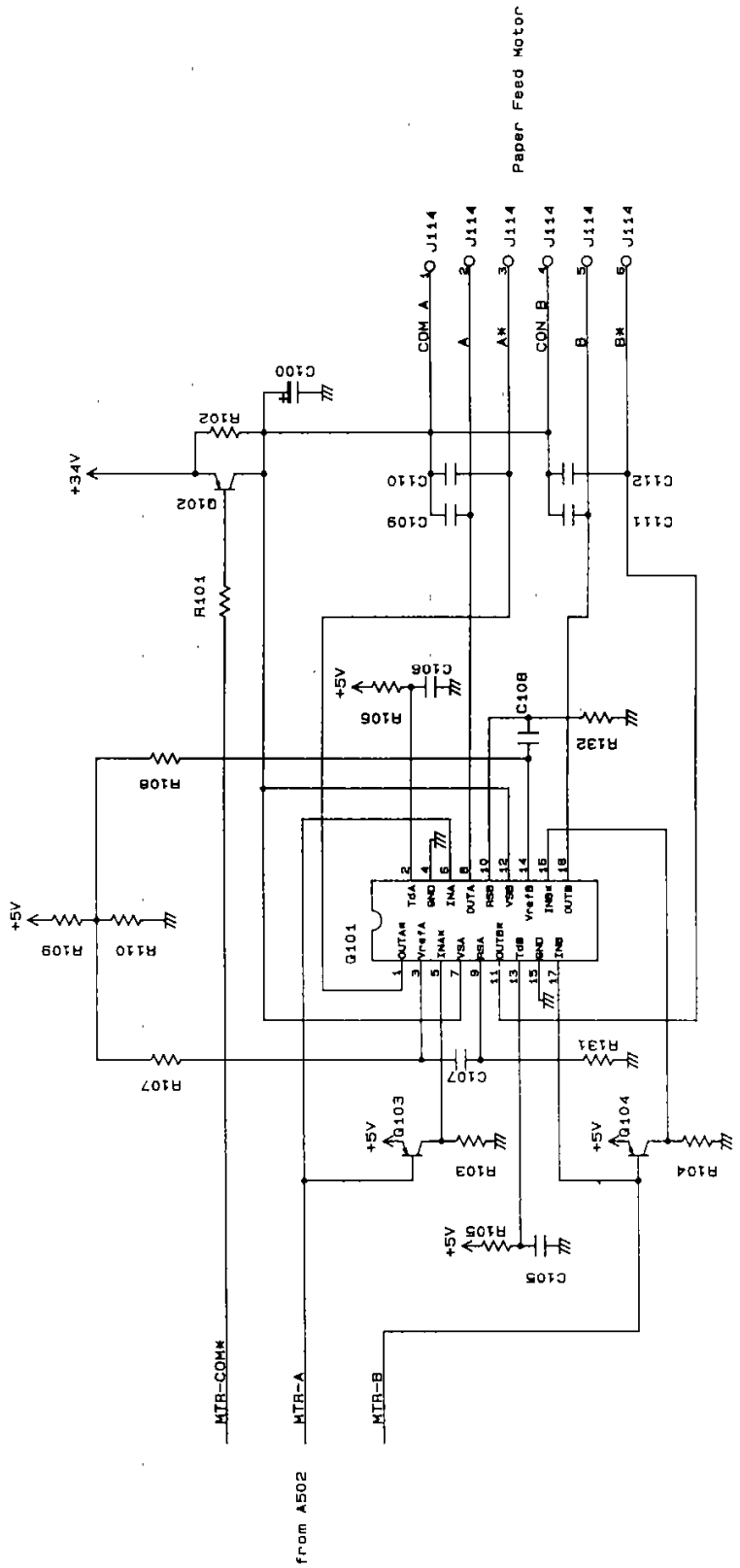
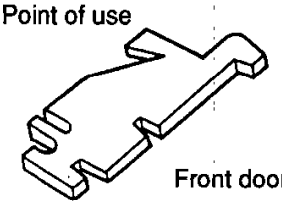
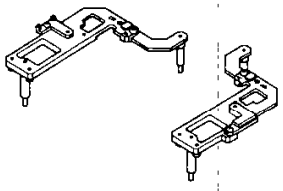
Driver Circuit Diagram (2/2)



P. SPECIAL TOOLS

See the table for the special tools used to service the machine in addition to the standard tools set.

No.	Tool name	Tool No.	Shape	Rank	Remarks
1	Door switch actuator	TKN-0093-000	Point of use  Front door	A	
2	Mirror positioning tool (comes in pairs; front, rear)	FY9-3009-000		B	For adjusting the distance between No. 1 and No. 2 mirrors.
3	Pulley clip	FY9-3010-000		B	For fixing the scanning cable in place.

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Q. SOLVENTS/OILS

No.	Name	Use	Composition	Description
1	Ethl alcohol (Ethanol) Isopropyl alcohol (Isopropanol)	Cleaning: copyboard glass, mirror, etc.	$C_2 H_5 OH$ $(CHZ_3)_2 CHOH$	• Flammable. • Use in a well ventilated area. • Avoid breathing concentrated vapor.
2	MEK	Removing toner or oil stains	$CH_3 \cdot CO \cdot C_2H_5$ Methylethyl ketone	• Flammable. • Use in a well-ventilated area and avoid breathing concentrated vapor. • Avoid contact with eyes or skin. • Do not use for cleaning the drum, plastic molded parts, or corona wires.
3	Heat-resistant grease	Lubricating the drive mechanisms; e.g., copyboard driving gear, fixing drive gear, fixing ass'y, etc.		Tool No.: CK-0427 (500g can) (Equivqlent grease can be used, but should be able to withstand 200°C for extended periods of time.)
4	Lubricating oil (low viscosity)	Lubrication points: Scanner rail, etc.	ISO VG 68 oil ESSO Febis K68 MOBIL Vactraoil No. 2 SHELL Tonna oil T68	Equivalent oil can be used. Tool No.: CK-0451 (100cc)
5	Lubricating oil (low viscosity)	Lubrication point: oneway clutch in pick-up control assembly	ISO VG 220 oil ESSO Febis K220 MOBIL Vactraoil No. 4	Equivalent oil can be used. Tool No.: CK-0524 (100cc).
6	Lubricating oil	Lubrication point: friction parts	Silicone oil	Tool No.: CK-0551 (20g)

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